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POSTURE HEARINGS

(EPA and NOAA)

HEARING
BEFORE THE
COMMITTEE ON
SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
NINETY-SIXTH CONGRESS
SECOND SESSION

JANUARY 30, 1980

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POSTURE HEARINGS (EPA and NOAA)

WEDNESDAY, JANUARY 30, 1980

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, D.C.

Mr. AMBRO. The committee will come to order. I would like to welcome Doug Costle, the Administrator of the Environmental Protection Agency. Later we will also hear from Richard Frank, who is the Administrator of NOAA.

Neither Doug Costle, or Dr. Gage, or EPA need an introduction to this committee, but I do want to say a few words about what we are trying to do in our oversight and authorization activities regarding EPA. Because of the shifting attitudes of our national concern over environmental pollution and its ambivalent focus by changing moods and changing administrations, there is not a large data base to work from. As a result, EPA is working literally at the frontiers of knowledge in its pollution abatement efforts. I believe that Doug Costle has recognized this and has vowed, as he says, to leave the Agency better than he found it. Based on these statements, Mr. Costle seems to recognize that stinting research efforts today only mortgages the future. The Agency must have reliable information in order to have a credible regulatory program.

No one is really in favor of pollution, but abatement actions are often strongly resisted because industry and the public are not convinced that harm is being done, or that the proposed actions will indeed abate pollution.

So EPA must have a high quality research program. We want to see what is being done to bring this end about. There have been enough adverse reports on EPA's research quality from such groups as the NAS, EPA's own Science Advisory Board, OTA, and this committee. So we know our concerns are real. We specifically want to know how the quality problem is being addressed. We believe, too, that shuffling the same people and programs will just not do it.

This year, continuing a trend, the Office of Research and Development is requesting a few more dollars, but is losing staff slots. This seems to be inexorable. My question is, how will EPA respond to this? It seems there must be a fundamental shift in the Agency's method of doing business. For example, perhaps EPA should establish a national laboratory, patterned after the DOE labs.

I would like to say parenthetically, too, that I hope we are not engaging in a budget game here. We see disturbing deletions and diminutions in programs specifically requested by this committee,

such as the aquatic weeds and the Great Lakes research programs. The budget seems to have ignored congressional attitudes and intent, and we would like to know specifically who made the decisions, why our views were ignored, and whether or not the Administrator can furnish us with the rationale behind what was done. I'm sure we'll get into that in our discussion, and I look forward to the statement of Doug Costle and Dr. Gage.

I would like now to ask any member of the committee if they would like to say something at the outset. Mr. Brown.

Mr. BROWN. No thank you, Mr. Chairman.

Mr. AMBRO. Mr. Blanchard?

Mr. BLANCHARD. Thank you, Mr. Chairman.

I merely want to welcome Mr. Costle here. I've heard nothing but good things about him. I'm hoping that maybe those good things can at some point be directed toward Great Lakes water quality and especially, from our committee's point of view, a research and development program directed toward improving the Great Lakes water quality.

Mr. AMBRO. Thank you, Mr. Blanchard.

Mr. Anthony?

Mr. ANTHONY. I will reserve my comments for the question period. Thank you.

Mr. AMBRO. All right.

Mr. Costle?

STATEMENT OF DOUGLAS M. COSTLE, ADMINISTRATOR, ACCOMPANIED BY STEPHEN J. GAGE, ASSISTANT ADMINISTRATOR FOR RESEARCH AND DEVELOPMENT, ENVIRONMENTAL PROTECTION AGENCY

Mr. COSTLE. Mr. Chairman, thank you. It's a pleasure to have an opportunity to come before the committee today.

With me is Dr. Steve Gage, who is the Assistant Administrator for Research and Development.

I have a statement, and rather than read it, if it would be all right with you, Mr. Chairman, I would simply like to submit it for the record and try to summarize it briefly so we can move right into the areas of most concern to you.

Mr. AMBRO. That will be just fine. We will accept your statement and include it in the record in toto.

Mr. COSTLE. Thank you, Mr. Chairman.

I suppose that, in a way, the concerns that this committee has with its jurisdiction symbolize the kind of continuing issue that I think EPA is going to have to live with; that is, the world is a lot bigger and more complicated and the problems a lot more sophisticated than we once thought. Although we're expending substantial sums of money to learn about our world, it seems that we need answers faster than we are able to produce them through research. It's a constraint that I think we've become even more conscious of in recent years. One of the specific things that Steve and I have sought to address in the 2½ years that we've had an opportunity to be at the helm is how better to link the research that is going on with the

needs that EPA has—the compelling deadlines and pressures to make regulatory policy—and to try to develop as complete a deck of cards as possible by the time we have to make those decisions; and second, to target better what our future research priorities ought to be. We don't live in a world of budget resources where we can simply go on fishing expeditions, cast thy bread upon the water and see how soggy it gets. At the same time we have to target those future priorities with the sure realization that we're probably not smart enough to do it perfectly.

But we've taken some steps internally at EPA to try to bring about a better relation between our research planning efforts and the needs that our program offices have and to engage the program offices more actively in the business of trying to forecast what our research needs ought to be in the future.

At the same time, and third, we've recognized the absolute criticality, if the decisions we have to make as regulators are to have public acceptance, that we have to insure that whether we have a full deck of facts or not we have carefully put those facts through a quality control screen. To that end, we have in a very aggressive way, I think, sought to extend to the scientific community, independent of EPA, and independent of the government in general, the opportunity to come in and perform peer review of our work.

One of the things I hope we have a chance to share with you this afternoon is some of the steps that Dr. Gage instituted in our grants program to improve peer review at all levels, to insure that the research done by EPA was not insular, that it was of a high quality, and that the process by which we obtained that research was one which was also subject to peer review.

The bulk of our research increasingly is done on an extramural basis. That is, we contract out or give grants to people to do research for us, and they are picked presumably on the basis of being the right person in the right place at the right time to make a real contribution. Frankly, we inherited a system that we didn't think was guaranteeing that and, in fact, if not watched pretty closely, it could almost be guaranteed to frustrate our effort.

I wanted to have an opportunity to publicly commend Steve to this committee for the rather hard bullet he had to bite in changing our fundamental granting and project selection system. It's not been an easy change. No fundamental change in an organization, even though it's an organization that's only 8 or 9 years old, goes down easy. Steve has, I think, carried it off in a very sensible way.

I am not here today to say that we've solved all of the problems or that we're now doing the job as correctly as we should, but I think we've made some important steps in the right direction. The quality of our research is improving and our ability to identify programs and target research is improving.

We still are faced with the fundamental problem that we can't do everything we'd like to do. That is a fundamental resource constraint that is shared these days throughout the entire Government. Most of our regulatory programs are not staffed to the level that I would like to see them staffed, given the magnitude of the problems with which we're wrestling. But again, those are overall budget decisions that are made ultimately by the President of the United States, balancing a

whole host of national interests, and we try our best to work within those constraints and to squeeze out of our system the very best product that we can.

But I look forward to a chance to get a feeling from this committee of where you think we are, what improvements you think you've seen, and where you think more improvements ought to be made, and for you to interrogate us, in effect, as to the changes that we've made and the advisability of those changes.

We've had a close working relationship with this committee which I say this quite sincerely—the Agency over its 9-year history has sincerely appreciated. So when we come before this committee we really look forward to the chance to talk very frankly with each other. We hope that you will be able to conclude that in the 2½ years that Steve and I have had this opportunity that we have, in fact, tried to be responsive to this committee's concerns.

Mr. Chairman, that's really all I would say. I would rather let this be your meeting at this point.

[The prepared statement of Mr. Costle follows:]

STATEMENT OF
DOUGLAS M. COSTLE
ADMINISTRATOR
ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
COMMITTEE ON SCIENCE AND TECHNOLOGY
UNITED STATES HOUSE OF REPRESENTATIVES
JANUARY 30, 1980

Good morning, Mr. Chairman, and Members of this Committee. I am delighted to be with you and to have an opportunity to review the progress the Environmental Protection Agency has made in its mandate to make this country a healthier and cleaner place in which to live.

When our Agency was created in 1970, we were concerned mainly about those things that we could see and that were obvious, such as the discharge of raw sewage into our streams and the proper use of pesticides in a growing economy. We did not have the tools then, nor did we foresee the problems of complex mixtures of chemicals going into our drinking water or the hazardous wastes leaching from thousands of landfills. We did not realize then that

what comes out of a stack in Ohio goes onto the land and the lakes of a state 600 miles or more away.

In the ten years since our beginning, we have worked hard on analytical technology, and we have developed better and more sensitive ways to detect exotic chemicals in the air and the water. As this technology has become more sophisticated, we are finding new and even more serious insults to our environment.

We have made much progress and there are many success stories. Throughout the fifty States we have instance after instance of clear-cut improvement in water quality -- some of them dramatic. The air is cleaner; there's no question about it. On the conventional pollutants that we set out to deal with, very real progress has been made. But new pollution problems appear as the old ones are being solved. We are now faced not just with attempting to discover how one pollutant affects health or the environment, but how mixtures of these pollutants can cause genetic alteration, neurological damage, fertility loss -- the subtle, degenerative kinds of effects that come from long-term exposure to fairly low levels of certain kinds of contaminants. We are also trying to comprehend the regulatory implications of discovering these new problems, as we move to reduce overall risk of exposure.

When I had been with EPA but a short time, I realized that unless we improved our research effort, I would often be making decisions on regulations with a scant background of scientific data. I then and there determined to leave my successor with better tools to make these decisions, because the potential costs of making them with possibly inadequate information was just too high to bear. Setting regulations too conservatively could cost the Nation millions or even billions of dollars for investments in control equipment or in lost productivity; setting standards too high could have even higher and more serious costs -- impaired health or unnecessary deaths for many citizens. It was readily apparent to me that investment in scientific research was one of the best investments we could make, one with a potentially high rate of return. I am pleased to report that we have been making real progress in this direction, and the next Administrator should have a legacy of sound data upon which to base decisions.

Under the direction of Steve Gage, EPA's Office of Research and Development has become more responsive to program needs. It now works closely with other Federal agencies in such areas as energy development and the environmental health sciences, and is beginning to look to the future to determine what problems we may be facing many years down the road. We are moving to improve not only the tools by which we determine the cost of our regulatory

actions, but also to quantify the health benefits of our actions. With the start of a program to develop research "centers of excellence" at several universities and the reorientation of the R&D grants program, we have made a good start on a well integrated long-term research effort designed to answer fundamental questions on the behavior, effects, and control of pollutants. This work is a vital complement to the shorter-term work done in response to the immediate needs of the regulatory programs.

The EPA has been given the lead responsibility for identifying, evaluating and controlling environmental pollutants. To support EPA's priorities, our research first addresses those pollutants which present the greatest health risk. Over the last several years, we have increasingly focused on dealing with pollutants as they affect human health, although we also strive to protect the environment by studying particularly sensitive and productive environmental systems such as wetlands. Our research programs are increasingly taking a multimedia approach to environmental protection through evaluation and integration of environmental problems at every point in the life of a pollutant -- production, transport, use, discharge and disposal. Our priorities undergo a very vigorous review not only in conjunction with the zero base budgeting process, but also in conjunction with research planning

committees which are co-chaired by researchers and regulators. Another increasing priority is the integration of all environmental programs. This integration is essential because legislation to control pollution now covers all environmental media -- air, water and land. In addition to the improvements made in our research planning process, the Agency has also initiated several changes in its research management to provide higher quality oversight of several key research areas by realigning its laboratory reporting relationships to consolidate functional or discipline groupings.

Coupled with this improved research effort, the Agency has also been making strides in its rulemaking procedures. As we must reach out and regulate ever larger numbers of smaller and smaller sources, we are finding other ways than "command and control" for getting more for less. Whenever we can get a pound of pollution removed for fifty cents rather than a dollar, we try to move in that direction. Over the last two years EPA has been developing a closely interrelated set of reforms that will allow us to get more for less. We fully realize that unless we find these alternatives, we will be facing increasing Congressional and public resistance, to the detriment of future generations yet unborn.

The Agency has also been moving rapidly to cement its relationships with similar agencies in other countries and with international organizations, particularly in the areas of the protection of the ozone layer, control technologies (including initiating regulations), acid rain, and the carbon dioxide "greenhouse" effects. No less important than preventing a nuclear holocaust is the prevention of global environmental disasters. I have personally spent many hours with my counterparts in other countries in attempts to prevent such disasters.

What I have been describing to you is my sincere conviction that we need a balanced approach, both nationally and internationally, to the questions of protecting the environment within a regulatory framework. In today's heated debate over the role of regulation in our society, some have lost sight of this need. From various segments of the business community, for example, we are now getting a seemingly endless series of broadside attacks on government regulation. Listening to this rhetoric, one might get the feeling that regulation is the root cause of all this country's problems -- the energy shortage, the economic stagflation and the high cost of beef at our local food stores. What is seldom conceded by those making these loud cries of "regulatory overkill" is the fact that regulations, particularly in the health and safety area, have produced significant health benefits. Crib deaths of children have

been cut roughly in half since safety standards were set in 1974. According to a GAO study several years ago, auto safety regulations are responsible for saving 28,000 lives between 1966 and 1974. A recent EPA study on national air pollution trends between 1972 and 1977 shows that sulfur dioxide is down 17 percent, carbon monoxide is down 26 percent and particulates are down 8 percent. The smog levels in our urban areas seem to be holding their own, but that's in the face of a 30 percent leap in car and truck travel.

While we are making substantial progress in the reform of our Federal rulemaking procedures to lessen the impact of our actions upon the economy of this country, the fact remains that in a society such as ours, a significant amount of regulation is necessary and will always be necessary. The public recognizes this need very clearly, as many recent polls have pointed out. Although the public is somewhat ambiguous about Federal regulation in general, when asked about specific kinds of regulation -- such as that affecting worker safety, clean water, and protection against toxic waters -- they reply that even more regulation is needed. These feelings have intensified since the onset of Love Canal and Three Mile Island.

It is both fashionable and easy to say that Big Government creates Big Regulation, or that some bureaucrat writes new rules just to keep himself employed. It is true

that there are some evangelical zealots, but they are few and far between. Much more obvious is the larger fact that our Big Society has spawned a thousand problems that you and I never dreamed of even ten years ago -- problems we first became aware of through their serious effects on human health. And a further fact -- one we are just beginning to recognize -- is this: If we reduce or postpone government control of potentially harmful activities now, the bill for that neglect will not only have to be paid by future generations, but it will likely be at a much higher cost.

Take the frightening example of Love Canal in Niagara Falls, New York. Niagara Falls and New York State are still trying to count the costs of that one-dollar "bargain" where a "dream community" was built upon and around the site of an abandoned dump full of toxic and hazardous chemicals, where children returned from play with skin rashes and where trees and gardens changed color long before autumn set in. Had the proper government regulation been in force at the appropriate time, it might have cost a maximum of \$4 million to find, construct, and seal a secure hazardous-waste facility. If the proper government regulation had been in force at the appropriate time, it might even mean that this chemical stew would not have been disposed of in such an irresponsible manner. Most importantly, it might mean that

much human suffering would not have occurred, that a young child would not be facing surgery to treat a cleft palate and an extra row of teeth believed to have been caused by prenatal exposure to toxics from the dump site.

Love Canal should tell us that it would be a grave error to fail to act now on such pressing health and safety problems. I don't want the responsibility for mortgaging the country's future and neither does any Member of this Committee. Let us not retreat to the dark ages of ignoring a problem, hoping that it will disappear. I urge Congress, and this Committee especially since you have a major legislative and oversight responsibility, to help our Agency achieve this balanced approach through improved science and technology and, thus, through better and more rational regulation.

Thank you.

Mr. AMBRO. I appreciate your statement and your summary and the written statement for the record.

I might say at the outset that I think we have had good relationships, this committee and the EPA. I think we regard ourselves as friends. But that doesn't stop us, of course, from engaging in a critical dialogue, and I think that's in the best interests of both of us.

As I said at the outset, the critical views that were expressed by OTA, GAO, NAS, SAT, XYZ, along with this committee, with respect to EPA manifests itself in a number of things.

First, the declining credibility among 435 Members, at least on the House side, of the kinds of regulations that come out of EPA because those regulations, it is perceived, are not based on quality research. I think I can cite a whole host of examples of that. But I think you know that better than I, so there is no point in doing it.

The question is, How does the EPA, indeed, measure the quality of its research? I heard you say that the quality of research is improving. How do you know that? I think we could start there because that's really the basis of what we're going to talk about today.

Mr. COSTLE. I have a number of ways to answer that.

First of all, as the Administrator who is not himself a researcher, I have seen an improvement in the quality of data that comes to me when I have to make a critical regulatory decision. A good example of that this last year was our decision on revision of the oxidant standard. There are several components to that which I would like to share.

First: Any scientist looking at that data would say, "Wouldn't it be nice if we had more data?"

Second: What have we done with the data that we have? And that data is not all self-generated. It's data that occurs in research in different countries; it occurs in research in our country; and some of it is data generated by us. In terms of pulling together the relevant data for the revised oxidant standard, I saw a distinct improvement over what my predecessors had in front of them when they had to make a decision.

Third: The peer review that I mentioned earlier gave us a much better handle on the range that we ought to be talking about in terms of health effects; it allowed us to quantify the data that we had in front of us, to weigh the several dozen studies, and it still didn't make it an easy decision as there are points in that data about which reasonable men can disagree. But it was, for the first time, I think, a really helpful dialog, and I have to confess to you that for the first time the research and development in EPA played a major central role in getting me to the point where I felt confident about a standard that I had to set.

It was not an easy decision politically either, particularly since in that instance we revised the standard upward, as opposed to downward.

So that's one indication, I think, toward how confident does the Administrator feel that the data he's getting is going to instruct.

Mr. AMBRO. Let's stick with the oxidant standard and the oxidant health data.

The Clean Air Act was passed a decade ago, in 1970, and that data and research has been needed, therefore, for a decade.

Why are you satisfied that the data that you received is better than that of your predecessor in the sense that that data should have been something that was collected and developed and available for years and years, or at least half a decade ago? Don't you think that that specific example indicates a degree of either complacency or foot-dragging on the part of the research office with respect to the implementation of the law and the development of meaningful, and significant, and acceptable regulations?

It's your own example. Let's use it.

Mr. COSTLE. I would certainly say that this country missed an opportunity 8 or 9 years ago, and we are undoubtedly missing opportunities today that will come to roost 8 to 9 years from now. Hopefully, we're missing fewer of them.

To make a research investment of a substantial enough magnitude to generate a better data base—in short, if we'd spent more money 10 years ago, the data that I had in front of me might have been more complete.

Mr. AMBRO. Whose fault is it that we did not spend more money years ago? Is it the fault of the Agency not requesting it? Is it the fault of Congress not pushing you into it? Is it the fault of OMB not recognizing the problem? Is it the fault of the administration in power at the time not pressing for it? Whose fault is it?

After all, these kinds of hearings are held to correct those kinds of situations.

Can you focus on things like that?

Mr. COSTLE. If I may say, Mr. Chairman, check all of the above. I think that's the reality of it. I don't really mean to say that in the sense that anybody was knowingly culpable about that 10 years ago. The fact of the matter is that today I could describe to you a set of problems that we didn't even know existed 10 years ago, that we are only beginning to perceive the dim outlines of today. And it would be an intellectual challenge beyond the capability of anybody in this room or, for that matter, probably beyond any group of scientists that could assemble, to tell us today to do the following kinds of research: A, B, C, D, E, F, G—so that we will have a result 10 years from now that is satisfactory to everybody. We're just not smart enough.

Mr. AMBRO. That's our problem. Our problem is that we do tell you in advance of the criticality, which I think is the word you used, of the problems, but you seem to ignore it, and that's why we're kind of up-tight in these kinds of hearings. We tell you that there will be problems with acid rain. Now, the consciousness, or the understanding, of any members around here isn't elevated to the point where they're pressing for acid rain research because they have other things to do. They might be dealing with Afghanistan, Iran, or a variety of other major problems.

But we see it coming. We tell you to look into it. And there's kind of resistance in the research branch. We tell you that the groundwater problem is getting more and more serious every day. We would like to do more with respect to it. There is resistance in EPA. We tell you that we would like you to look into this problem of aquatic weeds, or the pollution of the Great Lakes. We authorize money for it, and that, then, takes the form of having your own

budget submitted with either the deletion of one program or the diminution of another.

Why is that? The question was asked before as to who was at fault here, and you said, "Check all of the above." That had to do with the relationship between research and the Clean Air Act. What about the relationship now, as a result of the intent of Congress, between EPA, the things that this committee did, and the Congress has done, and the resistance on the part of EPA in moving ahead with these kinds of programs through more meaningful budgetary offerings?

Mr. COSTLE. To take them in the order that you mentioned:

ACID RAIN

The President has made a \$100 million commitment, which is pretty substantial—a 10-year commitment of \$10 million a year, to accelerate research on acid rain. We have, in turn, formed a partnership with Canada which, I think you will see shortly after their election, will express a substantially escalated dollar commitment on their side of the board to acid rain. The point is that we're not just relying on doing everything here. We're trying to get allies and partners to expand that total pot of resources that will be looking at the problem. You'll find no resistance from me in looking at the problem of acid rain. I spent 2 hours just before I came here—the reason I was late—meeting with representatives of six States of the northeastern corridor, who are very concerned about this. I come from one of those States. I think there is an acceleration of research in acid rain.

In terms of groundwater, I agree with you, we have to accelerate research there. The problem I'm having right now is determining how to address this over the longer haul. We've spent an enormous amount of money and time and effort developing methodologies for measuring the presence of chemical contaminants. We are behind the power curve in this country in terms of research into the health effects of long-term exposures to these contaminants. Think of how much money the National Institutes of Health have spent on cancer research and the National Cancer Institute. There is a range of other probable health effects, chronic health effects and delayed health effects, that are associated with exposure to the legacy of the chemical revolution that we are only now beginning to identify. I have yet to find a group of scientists, to be quite honest with you, Mr. Chairman, to sit and tell us we ought to do X, Y, Z, and have a sufficient number of those scientists agree that that's exactly what we ought to be doing.

The other areas that I think we, in fact, are deficient in is in escalating our research commitment to the development of technologies for purifying drinking water. Our instruments for monitoring and measuring have gotten to the point where we are finding what we go out and look for, and that's not a good sign.

Cincinnati's drinking water, which I may have used as an example on previous occasions, contains over 700 synthetic organic chemicals as it comes out of the tap. We know that 90 percent of those chemicals didn't exist 20 years ago. They're new; they're man-made synthetic chemicals.

Cincinnati happens to draw its drinking water out of the Ohio River. But we are finding chemical contamination of groundwater whether it's in New Jersey, Connecticut, Massachusetts, Texas or California. It's not a natural phenomenon because these chemicals are manmade. They're in very small amounts, and no scientist today will tell us that we're going to have a disease epidemic, a cancer epidemic, or any other kind of an epidemic. But it's just as true that no scientist today will tell us that we're not going to have one. We just don't know enough yet.

So that's an area where I agree with you, Mr. Chairman, we need to be putting more research money than we are, and we've been asking for that money.

Mr. AMBRO. I would like to interrupt you here just for a second.

You say that you and I agreed on this since you've been here. You say as well, Mr. Brown held hearings in 1975, and I was present, on the acid rain problem. I would say to you that the man I would like to introduce to welcome you as well has been most interested in this problem of aquatic weeds, and so after that introduction maybe we can get back to these kinds of points.

I would like to ask if the chairman of the full Committee on Science and Technology, Mr. Fuqua, would like to say a word of welcome.

The CHAIRMAN. Thank you, Mr. Chairman.

I apologize for being late. It seems like this week there's about four or five different meetings going on at the same time. I apologize for not being here.

But we are happy to welcome you before us, and look forward to working with your Agency in authorization bills for the very important work that you're doing.

Mr. COSTLE. Thank you, Mr. Chairman. I appreciate that.

The CHAIRMAN. As Mr. Ambro mentioned, and you're probably aware of, I'm very much concerned about aquatic weeds. Not only for my State but for many States, that is becoming an even greater menace, and I notice again in the budget this year that's still an item that is not included, and I was just wondering where in the priority of items of EPA for R. & D. does that break?

Mr. COSTLE. I will ask Steve Gage to speak to that as well, but let me make a general point, very much in line with something that Mr. Ambro said earlier.

There is a budget system that we have to live with and that we're given by the Office of Management and Budget, which is ultimately approved by the President before it's given to us. All agencies get it, a budget ceiling. That is a mark that says: Looking at the economy, looking at revenues this next year, looking at the full range of national needs that we have to address, the commitments we've already made—75 percent of the budget is largely uncontrollable now from year to year—here is the mark for your agency. Now, you're free to argue above it. We know you're not going to argue below it. So they tend to set that number high, but you have to argue within it, clearly. Then ultimately OMB has to rationalize the total budget.

We have fared pretty well in this Administration in terms of getting substantial increments of new resources.

It is also true that the demands upon us have accelerated in that same time frame. Indeed, as I look at the budget figures this year and at new responsibilities in the area of drinking water, hazardous waste, and toxic chemicals, that the very substantial increase that we've had over a 2½ to 3-year period has been basically eaten up by those new responsibilities. So some of our base problems have remained relatively stable, even in the face of real inflation.

That's the squeeze we're all in. So that means, in terms of what I do, is to say, "All right, within that set ceiling, how do I set priorities? We have set up a vigorous budgeting process for that purpose.

The CHAIRMAN. I understand how the budget is put together, and the pressures you're faced with. But the point I want to make is this does affect safe drinking water, and it's a program the Congress has supported year after year, and has put the money in over and above the budget. It's not necessarily the agency that has to extract the money from the people to provide this; it's the Congress that has to do that, and take that pain, and yet we give some direction as to how we think some of these programs should be going, and how they should be funded, and get the feeling that maybe you're totally ignored by the agency.

Mr. COSTLE. I don't really want you to have the feeling that you're totally ignored by the agency.

Basically what I do is say, "All right. I've got a ceiling to live within." I have to take first to the President and then to the Congress with his concurrence what I think the priorities ought to be within that ceiling. Everybody understands that as a vital piece of the system. The President proposes, but the Congress disposes, works its will on the budget. Moneys that are appropriated we, in fact, spend.

But to be honest, I don't think I'd be doing my job if I didn't at least say within the constraints I have to operate under I've got to do the most conscientious job I can of setting priorities. It's not easy. I have to compare various research needs with, say, those in hazardous chemicals, where we're suddenly about to impose a regulatory system on 300,000 generators, 10,000 transporters, maybe 30,000 sites around the country. We've been unable to get any community to agree to a new site. Some of these wastes look a lot like nuclear wastes, in terms of the potential hazard they represent. We're dealing with a legacy of dumps out there now, for many of which we can't find the financially culpable party to take corrective action.

I've got to compare that with drinking water, with the 16 different statutory responsibilities that I've got. All that judgment represents is that within the total here's how I'd strike the priorities. That really represents an invitation to have those priorities changed by the Congress if the Members really feel differently about it. You give us a fair opportunity to come up and try to persuade you that our priorities are better, but that doesn't mean that we are always successful in that job of persuasion.

The CHAIRMAN. I hope that's not the case this year either.

Thank you, Mr. Chairman.

Mr. COSTLE. We will be doing research, I promise you, on aquatic weeds this year.

Mr. AMBRO. Did I understand you to say that OMB gives you the figure and you work within the framework of that figure?

Mr. COSTLE. Yes. That happens to all agencies. Actually since we've gone to zero based budget, they'll give us a range and say, "Here's your planning target." In the spring they will do a planning exercise themselves, and say, "We think the economy is going to look like this next year, and we think that revenues are going to look like this."

Mr. AMBRO. You mean the first initiative is they say, "Here's your range," and then you go back and work within the framework of that range? Don't you put your budget together, go down there and have a bit of dialogue with them?

Mr. COSTLE. Invariably we go in, like every department and agency, and we say to OMB, "We can't live within that." They invite that; they say, "Come down and tell us what you can't do." But what that does, though, is it allows them to identify very clearly—and you have to have some process like this because you just don't grow money on trees—

Mr. AMBRO. We all know the process, though.

Mr. COSTLE. But you have to have some way of isolating those issues on the margin. So they say to us, rightly I think, "What would you do if you had 10 percent more? What would you do if you had 10 percent less? What would you do if you had 20 percent more?" and we make those arguments. We win some. We lose some. Then you change it all around anyway, which is your right.

Mr. AMBRO. I would like to, in this first round, go to Mr. Brown for a series of questions.

Mr. BROWN. Thank you, Mr. Chairman.

Mr. Costle, from your statement and other observations I feel reasonably confident that the Agency is making steady progress in a number of areas, including the quality of the research, the efficacy of, or whatever other way you want to describe it, the regulatory process.

The question that I think we have to explore is whether or not the progress is adequate to the needs of the situation, and I'm going to confine myself basically to the research arena.

Is it moving us more effectively toward the solution of the highest priority problem? Is it taking advantage of all of the opportunities that might exist? Are there any blinders on our approach that would prevent us from achieving our objectives more readily or with less difficulty?

We have to consider these problems with the information that we have and make our own inadequate policy judgments and attempt to provide whatever guidance we can, and I will confess to you, as I'm sure you know, that I have never been completely satisfied that the Congress understood the problem well enough to give you the kind of policy framework that's needed, but we have to keep trying.

I am concerned about the basic method that you have of identifying and managing your research to solve the problems we're facing, and it seems to me that there are still some gaps here, there are some needs that haven't been met.

If I may oversimplify, it seems to me that the Agency has to be concerned with a certain base line condition, which may, we'll say, have existed from time immemorial, with regard to the environment, which provided the conditions for human beings to exist. This isn't to give it a value. It may have been bad or good, but it's what existed, and now we have been perturbing this at a more and more rapid rate.

Do we have a basic framework of data which allows us to say this is the baseline? Because if we don't we can't say what the perturbations are. If we have the baseline data, then can we begin to say that these are the pollutant effects; these are what's coming into this environment that are different; these are the measurements of it; this is how it was produced, transported, transformed, the ultimate fate, and what the human effects are? Do we have an integrated program for looking at a range of high priority possibly hazardous pollutants to be dealt with?

That is the beginning, and it's only a part of the problem because we will find that there are a host of other problems contained within this framework, and they will involve the development of, say, monitoring technology and the improvement of that, the improvement of our analytical processes, the ability to determine health effects through adequate toxicological or epidemiological surveys.

I know you've been concerned about every one of these areas, but are you satisfied that within some sort of a total battling framework you're making the progress necessary here, and if not, what are the weaknesses that need to be corrected?

Let me give you a small example that comes to mind. You mentioned Love Canal. Here is a situation where the environment was perturbed. Do we know yet how much it was perturbed, how much of what toxics are present. It had certain transformation that went on there, and it impacted the human beings who lived there. You mentioned the effect of a child with a cleft palate, or some other aberration. Do we have any understanding of or the ability to trace the individuals who were exposed to that and determine what happened to them because in a microcosm that's the problem that faces the whole country, and I don't think we have it yet. Do we have an information system that would allow us to compile that kind of information that cuts across geography and any other boundaries?

I've been very dissatisfied with our ability to do sound epidemiology, for example, on the whole range of toxics that affect the society in this country, and I would be very happy if I thought that at least the problem was recognized and there were some initiatives to do something about this on a substantial scale that could give us some answers, not today or tomorrow, but this is long-range research. Twenty years might do it, and the scale of the problem is 20 years. What happened at Love Canal and most other places that were exposed to toxic pollutants over a period of time will have its effect 20 years from now, and if we don't have the vaguest framework for dealing with that we're going to be caught up in the problem 20 years from now.

My pet peeve, of course, is lead. I began 30 years ago to investigate the effects of lead on health, and you know today we don't understand the effects of lead on health and I don't think we have a system that will give us the answer in another 30 years.

Mr. COSTLE. In fact, I think in that instance the problem hasn't been a lack of money necessarily either. I think, in one sense, I can make you maybe happier in that that problem is recognized; increasingly it's recognized with respect to chemicals; toxic chemicals, are forcing an integration of thinking at EPA. These chemicals are now reaching out and affecting the way other people, other agencies, other institutions operate. I point to the relationship, on which we've testified before this committee, between ourselves and the Food and

Drug Administration, the Occupational Safety and Health Administration, and the Consumer Product Safety Commission for pooling information, for having coordinated systems, so that if one agency is interested in chemical X and another agency also happens to be interested in chemical X we know about it, and we can work together, plan together.

We are more effectively networking our resources than I think we ever have before.

The part that I can't leave you happy with, basically because I agree with you, is whether we're ever going to have that baseline. I think the baseline, among other things, is a constantly moving target in a world that's so incredibly complex.

Even if you go into the Arctic today in the hope of finding a pristine area and you do a core sample on the ice, you'll find evidence of the industrial revolution; you'll find evidence of toxic chemicals; you'll find a history of mankind. I don't think we can find a place as a baseline.

What we can do though, and we are getting better at it, although it's slow, is piecing together fragments of evidence. If the evidence were described as a straight line that ran from one wall in this room to the other wall, what you would find is a thousand breaks in that line, but you begin intelligently looking at fragments of information; you begin drawing some preliminary conclusions from that information; and after a point, while there's still potholes in the road, you feel fairly confident. This is no different than how research scientists normally work. You won't meet a scientist who won't tell you he'd like to have another study; that's what they all say.

But at some point in time you have to fish or cut bait, and then the question is, how confident are you in what you already know and what does that tell you?

But it is a very complex world. The perturbations against the world are a constant set of moving targets. We're getting more sophisticated, but we have a long way to go, I agree with you.

Mr. Brown. I need more quantitative responses to that at some point, if not here.

I know that we have a moving baseline. We haven't any assurance that we're going to be able to pin it down at any point.

Are we going to be able to say we have a reasonable inventory from which we can measure deviations of conditions 10 years from now? I don't expect us to ever be able to identify the pristine world, as you described it. But are we describing today's world? And I don't think we are.

Mr. Costle. We're describing pieces of it. But you're absolutely correct.

Mr. Brown. You paint a nice picture of pieces that ultimately will all connect up. I don't see the framework. I see a collection of isolated dots, which we're going to get more and more of, but we're never going to see how they relate to one another.

You could take a simpler thing like toxic chemicals if you're going to talk about it. Take trace minerals, of which lead is one of many. We have histories of experience with trace metals that go back thousands of years, and yet I don't think we have an integrated research program today that will satisfy any scientist that we under-

stand the whole process of how trace metals accumulate through the biological chain and what levels are hazardous to humans or anybody else.

Take, in particular, the waterhyacinth which we were discussing. Do we know how that accumulates metal, which it apparently does very readily and frequently?

This is a fairly straightforward kind of a research project that could be turned over to a major research institution, and say, "Here's what we want. We want to know everything there is to know about what happens to trace minerals, metals. Take 10 years to do it, and give us the picture." That would be a framework, and which they would probably say, "That will cost you \$10 billion, and you can't do it," but at least they would analyze the problem and say, "Here is what you are asking us, and here is why you're not going to get the answers," and I don't see that happening in our total research posture.

If Dr. Gage is eager to come in and say something different, I would like to hear it.

Mr. COSTLE. You don't seem too eager, Steve.

Dr. GAGE. I wouldn't want to preempt my boss in this instance.

I think there are several initiatives that have been prompted, at least in part, by this committee over the past few years that are beginning to fit a few of the pieces together, Mr. Brown.

Starting from the health end, we are attempting to use the data base that will fall under the National Center for Health Statistics. I know that that's been a particular interest of yours. The National Center now has broader authorization. It's having a great deal of problems with its appropriation. We're trying to help them get to a position where, in fact, they can get the kind of data on a broad range of health effects that we can tie together with the monitoring information to look at these broader scale, sort of macro-scale, epidemiological studies to which I think you're referring.

At the other end, the location of chemicals in the environment, I think, is beginning to come into some form in EPA. Our Office of Pesticides and Toxic Substances is putting together a coordinated toxic substance monitoring strategy, which will drive literally tens of millions of dollars of investments made by our Water Office, our Air Office, and our regional offices, and most of the States in assembling this data and putting at least those two data systems together. Starting cross-correlations ought to take us a lot farther down the road than we have been before.

To bridge the gap inbetween, we're taking certain sets of chemicals, certain classes of chemicals, trying to understand how they really do get from the source out into the environment, and eventually to a receptor to expose someone.

But those studies are particularly expensive, and we're able to do only a limited number. We're trying to select chemicals out of this set of chemicals that are of most concern, and make sure that we track those at least as early indicators of problems.

Mr. Brown. You have a problem with doing that. You can't do human experimentation, and that's a problem in trying to determine dose effects, responses, and hazardous quantity. But one answer to the fact that we can't do human experimentation is to take advantage of those cases where the experimentation has been done for us and capitalize on the information. We need a better system to do that.

Mr. COSTLE. We certainly do.

Mr. BROWN. And it needs a major effort, as a matter of fact.

We've had thousands, possibly millions, of our population exposed now to radiation, to chemicals, to hazardous breathing, to a lot of things, and we still have inadequate data on effects because we're not able to trace these people.

Mr. COSTLE. We're dealing with a universe of $4\frac{1}{2}$ million chemicals and 45,000 minerals, produced in commercial volume; we're talking about mobile populations.

A contrast, for example, is China, where people tend to live their entire lives within 15 miles of where they were born. It's a homogeneous population, in terms of ethnic background. They eat the same diet. They keep health statistics, I hear. In this country we have a highly mobile population. We have an ethnic diversity that is extraordinary. We have diet diversities that are extraordinary.

It is a complicated puzzle, which I think is what you're saying. We can't be smarter than we really are. All I think we can really do, to be perfectly honest, is to try to assemble something like a giant puzzle. You find a couple of pieces that fit, you put them in where you think they belong, and then you find some more pieces that fit. Over time certain pieces of the puzzle begin to take shape and form, and that gives you a lead. It may give you some false leads too, and you pursue them.

Maybe that's too simplified an approach.

Mr. BROWN. I'm not going to belabor this, but your mentioning China leads me to think immediately that if this is the case in China maybe we ought to spend half of our money in China getting the information that we need over there, where they don't have the mobile population, and where we can control the environment much better.

Mr. COSTLE. You may think when I say this that I laid a trap for you. I promise I didn't intend to. But, in fact, we intend to negotiate an environmental agreement with China, and the main motivation on our part is to see if there is a way to do epidemiological studies there on things to which both populations are exposed.

Mr. BROWN. I'm very interested in these international cooperative agreements, and I notice that you referred to them.

The other extreme of that, of course, is to go down and cooperate, with Mexico, where they're poisoning a good section of their population their chemical complex regions, because they don't have any regulations down there.

Mr. COSTLE. We tried that, as a matter of fact.

Mr. BROWN. We couldn't do that up here, but we could at least help the Mexicans understand what they're doing to their people.

Mr. COSTLE. I went partly with that purpose in mind, and we signed an environmental agreement with Mexico last year. Since the Campeche oil spill we've had a little trouble with our communications and, frankly, the Mexican Government has been somewhat slow to respond to suggestions such as this for their own reasons.

I agree with you, and it's one of the reasons why, with Canada particularly, on acid rain we got a willing, eager partner. It's a way to amplify our resources. It's a way maybe to get smarter about things, because they're very bright, and they're going to think of things that we didn't think about, and vice versa.

Mr. BROWN. I'll pursue this later.

Mr. AMBRO. Thank you, Mr. Brown.

I understand you have to leave, Mr. Costle. I would, then, like to call on those members who asked that they be given the opportunity to say a word or two before you do leave, and then we will go on to the questioning of Dr. Gage.

I would like to introduce the ranking minority member of the Environmental and Natural Resources Subcommittee, Mr. Walker. He wanted to say a word or two.

Mr. WALKER. Thank you, Mr. Chairman.

I will be brief. I would hope that at some point in the future we would have a chance to discuss the concerns I have with the diesel program.

I am somewhat disturbed by the fact that your own science advisory board has indicated that in fact the epidemiological program and diesel emissions program lack adequate and mature direction.

I think that that's a real energy problem for us in the future. As we attempt to get the automobile companies to appropriate fuel economy standards, and they have the technology, yet EPA is standing in the way because there is not an adequate program to give them the confidence of what they've invested money for in that program, and I think the subcommittee is going to look into that in the future. I would hope that we would have the chance to discuss it with you.

Mr. COSTLE. Indeed. In fact, I would welcome that opportunity.

The peer review mechanism that I noted at the outset this afternoon, was set up in part to find out where our diesel program wasn't working right. I think we're going to be doing research on the diesel for a long time, and it's also a good example of the case of how much do you have to know before you know enough to take some prudent action, and what is that prudent action in light of your knowledge and the state of your knowledge. We have a number of exciting ideas on that—it would not be just a government invented type program, but one that would creatively involve the auto industry itself. I would welcome the opportunity to come up and meet with you on that.

Mr. WALKER. Thank you, Mr. Chairman,

Mr. AMBRO. Thank you, Mr. Walker.

Mr. Wydler?

Mr. WYDLER. Mr. Chairman, I know that Mr. Costle would like to leave, so I'm going to ask for permission to submit the questions I have to him for the record, and I hope you will give us rather quick answers. There are some specific questions that I have for you, and I would appreciate a rather prompt response to them if you can give it to us.

Mr. COSTLE. We'll do that.

Mr. WYDLER. Thank you. Thank you, Mr. Chairman.

Mrs. BOUQUARD. Mr. Chairman.

Mr. AMBRO. I was going to call on Mr. Blanchard next.

Mrs. BOUQUARD. I would just like permission to submit my questions in writing for the record also.

Mr. AMBRO. By all means.

Mrs. BOUQUARD. Thank you.

Mr. AMBRO. Mr. Blanchard?

Mr. BLANCHARD. Thank you, Mr. Chairman.

Mr. COSTLE, I mentioned earlier my concern with the Great Lakes water quality research and the effect of that water quality on human health.

There are a lot of people, in Congress and out of the Congress, and probably in EPA as well, who think of the Great Lakes as some sort of regional, or parochial matter. It is kind of regional because it only involves eight States.

Mr. COSTLE. It's a big region.

Mr. BLANCHARD. Yes. But it also involves our relationships with Canada. Forty million people live around that region, and it is about 95 percent of the surface freshwater in the continental United States, something that any time you repeat that people here have a hard time understanding.

You may be aware—I know others who are not directly involved in these programs are aware—of the fact that there are certain Great Lakes programs going on, one of which is in Grosse Ile, Mich. It's not in my congressional district, nor near it. But they do very good work on Great Lakes water quality research, and also now they've gotten into the whole effect of toxicants in freshwaters on human health.

Mr. COSTLE. This is Wayland Swain's group.

Mr. BLANCHARD. Yes. And we added money to the budget last year. We specifically wrote it in because you had deleted it, OMB, or you, or a combination. I note that you still aren't ready to obligate that money, and this year's budget comes in again with it slashed.

The problem I have here is that while you, sir, have, from what I can gather, whether I talk to Mr. Dingell or others from Michigan or members of the committee, an excellent reputation. The message that I get from people down the layer of bureaucracy at EPA is there really isn't any concern here in this town for Great Lakes water quality at all, and, second, if there is, you figure we're going to stick that money back in, so you can cut it out of the budget, as you do with Mr. Fuqua's interests, and we'll put it back in, and then we've added the money and you haven't.

I'm really in a situation where I am—and I think most members of this committee are—willing to support research and development, but it's becoming more and more difficult to get public support for it, and I'm at a loss because I don't know whether maybe there is something you can tell me as to why I'm wrong in insisting on these programs, whether I should ignore you, or go find some other functions that you want and try to delete those.

What do I do to get you people to become aware of these programs? What is it that I am missing? I realize your resources are limited, if that's your answer. Why are you people being disobedient?

Mr. COSTLE. I don't know the specific answer to the question you ask about that lab. Maybe Steve can elaborate on that. But I will certainly make myself familiar with it.

Mr. BLANCHARD. I'm just at a loss here. We can go on every year and play this shell game, and adding the money. I'd rather have you say "It's a lousy program," and we'll face that fact, rather than just simply say the resources are limited.

Mr. COSTLE. No, I can not say it's a lousy program. The reality is that as a minimum we probably have 10 hot research ideas, and we only have money for 1 or 2. That doesn't mean that the 8 or 9 that we

don't do are no good. But it does mean the hard choice of priorities, which is not our choice alone. I understand that, and it shouldn't be.

But my frank dilemma is that I have to somehow try to make whole, within the limited resources that I have, the best program that I can, and I surely don't claim to have any special lock on wisdom on that. I often have a little bit better access to information, and I get to see all the little pieces perhaps a little bit better than others. But that doesn't necessarily make my judgment the best in the world.

But on that specific lab, Steve, can you add something?

Dr. GAGE. I think what Mr. Blanchard is referring to is the lack of EPA's carrying through the \$2 million add-on by Congress in the Great Lakes component of the water quality R. & D. budget for fiscal year 1980.

We did not sustain that through our zero based budget review. As it turned out, the water quality medium within the research and development budget faced a reduction from \$65 million to \$60 million, but that was used to a large degree to pay for our significant increases in drinking water, small systems supply development work, toxic chemicals tracking work, and in the highest priority effort at the Agency this year—hazardous chemical response.

So it was one of those situations where, even with some increase our overall resources, through our budgeting process, it just had to give way to the three things that I mentioned there.

Mr. BLANCHARD. We specifically wrote that into the law. The law technically hasn't taken effect because of an impasse apparently between the Senate and the House. And we can do that again.

But what you're saying is you've ignored our will. I realize there's a fine line between making law and executing it, and I don't want to play scientist with you at all.

Dr. GAGE. It's my understanding that there was an appropriation of \$2 million for fiscal year 1980 associated with the authorization language as well, and that is proceeding ahead. There's no problem whatsoever with that.

Mr. BLANCHARD. As I understand it, the lab was asked to even return some of that back to you for a new grants program.

Dr. GAGE. Let me clarify that.

We are at this point planning on using some portion of that money as part of our competitive grants program. But that portion will be specifically delineated for Great Lakes research, and will probably lead to the involvement of more universities around the Great Lakes actually being involved in that Great Lakes research program than is now the case. So this will be Great Lakes research funding, applied to the Great Lakes, just sent through a different peer review process than is now the situation.

Mr. BLANCHARD. There is a program in conjunction with the University of Michigan right now of monitoring the sediments, which is a very hot issue from any point of view.

Mr. AMBRO. Will you just suspend for a moment?

Maybe you can get back to that with Dr. Gage.

Mr. COSTLE. I would be happy to come up, and we'll track that to make sure that we both know exactly where the pieces are on that.

Mr. BLANCHARD. But, beyond that, it wasn't recommended for continuation, and that concerns me. All I can tell you is that I can

accept easily any claim by you or your people that there are more important things, not only in this world, but also in your budget, and certainly on the agenda for research and development. That I accept. But you can bet your bottom dollar we can find things that all of us feel are less important and take them out of your budget and put this back in, and I think that is what we will do.

But I don't see the need for that kind of a hassle when basically there was agreement with the committee that this was important, and that there are a lot of problems and we would want to work together. I just don't understand it. I think it's a shell game, probably imposed on you by OMB. But if you can shed some light on it later—because you have other things to do today—I would appreciate it.

I just think it's a lot of wasted time, and I'm wasting my colleagues' time right now for something that I've already either convinced them or hoodwinked them to go along with anyway, and it's unnecessary time.

Thank you.

Mr. AMBRO. I find your remarks always efficacious and never a waste of time.

But I would like to before you leave, Mr. Costle, call upon the other members who might like to say a word.

Mr. Anthony?

Mr. ANTHONY. Thank you, Mr. Chairman.

I would like to make a few general comments, and then ask you to specifically look into a couple of areas that give me a great deal of concern, and then I have one final question that I would like for you to respond to in writing for the committee.

The thing that disturbed me the most in reading through your prepared testimony was the length and breadth of the comments that you made concerning the outcry from either business and/or what may be called special interest groups concerning the Government's role in regulating them, and one could read that statement and almost see some bit of paranoia in the preparation of those comments.

But let me say this: As one who decided to run for Congress, No. 1, because I came from a small business background and, having sat around the boardroom making critical decisions that involved great sums of money because of legislation that was passed, rules and regulations that were being implemented, and it suddenly seemed—also having spent some years as a prosecutor, and in that process we had a grand jury system, we had a bill of information system, but the client was always presumed innocent before he was proven guilty, and then suddenly to be cast in a system where one single employee could walk into your plant and summarily say that you're in violation of some hazy rule or regulation, which you'd have a difficult time finding and a more difficult time interpreting, could not get the same interpretation between two, or three, or more people who were asked to interpret it, and, in fact, being inspected by two or three, and different, inspectors over a period of time, I will say gave me the courage to run for Congress in the hope that one small voice could be felt in Congress about this.

It disturbs me a little bit because you are the Director of a very important agency that has a great deal of impact economically, as well as healthwise, over business and, although you may perceive it as

somewhat of hysteria, I can tell you that the grassroots is there and that the emotion was felt many months and years before business finally got the guts to speak out, and they are only trying to do what many others have done, I think very adequately, and that is just protect their own self-interests in the hopes that they can stay in business and not add to what is already an overburdensome rate of inflation.

I will say this in behalf of EPA: I think that your agency is in the process of maturing, and I think you have done some things that have been perceived in the business community to be in the right vein, and I would like to congratulate you on that.

But it still disturbs me, just reading those comments, and as many comments as were placed in this record, primarily in a hearing that was set up to determine what you were doing and what your budgetary needs are, and I would just ask you to do a little self-examination.

I consider myself to be part of the business community that would like to speak out for reasonable regulation.

You may want to comment on that, and then I do have a couple of inquiries.

Mr. COSTLE. Yes.

Accept my apologies if that statement comes across as paranoid. I don't feel paranoid about it.

Regulatory reform is a fascinating area right now. The other hat I wear is Chairman of the President's Regulatory Council, which has a very specific, concrete role in trying to bring about regulatory reform.

Mr. ANTHONY. I'm glad you mentioned that because that was going to be my followup question, and if you will permit me, let me interject one comment.

Mr. COSTLE. All right.

Mr. ANTHONY. Is the Regulatory Council of any benefit, and do you think that it should be continued, and is this going to be a worthwhile venture to accomplish this meeting of the minds?

Mr. COSTLE. It's a complicated subject, but let me try to be very blunt, at the expense of oversimplification. If you look at what's happened over the past 2 decades—in the last 20 years Congress has created 20 new regulatory agencies. Take the field of cancer regulation. There are now 21 laws that either impel, or require, or encourage, or authorize the Federal Government to regulate cancer-causing substances, whether it's in food we eat, whether we breathe it in the air, or however we might be exposed to it. They are administered by seven different Federal agencies, and every one of those laws was passed after hard debate in the Congress. They were passed in response to legitimately perceived needs. But, in effect, we have suddenly rewritten the fundamental social contract in a lot of ways between business and the rest of us as individuals. Frankly, the Executive Branch is staggering under the weight of trying to figure out the necessary management techniques to insure that we implement these legislative purposes in a sensible, fair, not unduly burdensome way that is also effective. It's a big job, frankly.

Ill thought out regulation serves nobody's interests. I can point to examples—if I remember right, in one case if you happen to saw logs crosswise you don't need a certificate from the ICC, but if you saw them lengthwise you do. You can transport gerbil food but not parrot food.

Part of the function of the Regulatory Council is to find out those areas and to try to bring about a measure of regulatory reform. Our conviction is, frankly, that poor regulation serves no one's interests. Needed regulation should be cost effective, with emphasis on both cost and effective. We have a large sorting out to do, the process of which has begun, and the Regulatory Council is playing an important role. OSHA dropped over a thousand of its regulations on the grounds that it didn't think they did much. The President just signed an Executive Order that requires us to do a two-tier approach, specifically to recognize any problems that small business may have in complying with Federal regulation.

The body of regulations that are now on the books, all of which are driven by law, didn't happen overnight, and I think there is no simple law for reforming it. But there is surely heightened awareness of the fact that to get these legitimate purposes accomplished we have to do a better job of trying to manage that overall cumulative burden, both in terms of the cumulative weight as well as the individual specifics of single regulations.

I would really welcome a chance to come up and meet with you and tell you a little bit more about some of the things we are doing.

Mr. ANTHONY. I would welcome that, and I offer you that invitation to do so because I have a thirst for knowledge in that area.

A subcategory here about regulation: In an attitude of whether or not the EPA would be willing to act as a conciliatory body or agency when States have differing standards that have been implemented as the result of regulations that have been promulgated as a result of legislation that's been enacted by Congress.

I'll give you a classic example: Texarkana, Ark., and Texarkana, Tex. I represent Texarkana, Ark. For 7 consecutive years they have not been able to resolve the difference between their water quality standards from the Texas side to the Arkansas side, and they are imbalance. They are in the process of trying to put together a very massive waste water treatment facility, but they can't get the State of Arkansas to move and they can't get the State of Texas to move, and they can't get EPA to move, and as a result you can just draw a circle around this area down there, and you can talk all of the high-handed theory that you want to about regulation and how we want to hand down to generations to come, our great-grandchildren, a good, clean Earth. I want to tell you what my people are really interested in. They're interested in the nuts and bolts of making this country operate, and that's where they get either mad or happy, and right now they're mad because they can't get anybody to sit down and work out a problem which everybody acknowledges is a problem.

So I offer you a special invitation to make yourself aware of that so we can talk about it when you come up.

Mr. COSTLE. I will.

Mr. ANTHONY. But back to the broader question: Is EPA willing to act in a conciliatory—

Mr. COSTLE. A mediation type role?

Mr. ANTHONY. Mediation.

Mr. COSTLE. We would be happy to.

Mr. ANTHONY. I mean do you? Are you? Do you now around the country, or are you willing to?

Mr. COSTLE. We do, and as often as not, incidentally, the States prefer settling problems between themselves rather than have us come in. But we have, in fact, offered and have done this kind of reconciliation. In the Clean Air Act at least there is a section that requires us to play such a role, and we're about to engage in some major adjudicatory hearings between two States in terms of sources that one State wants to permit and that the downwind State says will mess up their air quality.

Mr. ANTHONY. This is a typical situation. The discharge is in Texas, but the pollution is in Arkansas.

Mr. COSTLE. I think that's exactly the kind of role we ought to be playing.

Mr. ANTHONY. Another area in which I have a question with regard to the regulatory is whether or not you'd be willing to intervene in a reconciliatory attitude when you have a difference of opinion between agencies within EPA. Whom do you go to reconcile those differences?

Again, I could point to a case in point, where everybody on one level is willing to work it out, the State pollution control board and the industry is willing to work it out, and have agreed to what they want to do, and even one division of the EPA. Yet, they feel that if the decision is made then that will impact on maybe something else that will happen in this other agency, and all of a sudden you're just stopped.

Mr. COSTLE. The answer to that one is simple. When there are differences of opinion within the agency, the buck stops with me, if I'm aware of them.

Mr. ANTHONY. You're going to get a buck on your table.

Mr. COSTLE. I'll get a buck slip on that one.

Mr. ANTHONY. I would like to submit two questions for the record, Mr. Chairman, with your permission.

One will deal with the extent of the groundwater problem and some of the things that you're doing in that area because I have a great deal of interest in that area and will hold a water conference in my district before the year is out.

Then just a very simple question, and that is: What are the most significant aspects of the President's fiscal year 1981 budget for EPA in your viewpoint, in EPA's viewpoint? Could you just delineate for this committee what are the most significant aspects of the budget for me?

Mr. COSTLE. I would be happy to do that.

Mr. ANTHONY. I would appreciate it.

Mr. COSTLE. And we look forward to a chance to work with you, Mr. Anthony.

Mr. ANTHONY. With that, Mr. Chairman, I yield back the balance of my time.

Mr. AMBRO. Thank you, Mr. Anthony. I must say that the interest you exhibit is multiplied many times over, by the number of members here, and I really do think, having spoken to Mr. Brown about this, that we would like an additional chance to talk further with you. We know you're under a time constraint now, but maybe we can set up a meeting when the time factor is not so pressing so that we can talk about some of the questions that relate to the Agency as a whole and those that affect the whole R. & D. which, therefore, require your kinds of responses in depth at another time.

Mr. COSTLE. I would be happy to do that.

Mr. AMBRO. I mean shortly too.

In keeping with what I said earlier, I would call on Mr. Royer for 1 minute or 2, and then call on Mr. Mavroules, and then I'll let you go.

Mr. ROYER. Thank you, Mr. Chairman.

First of all, I would like to ask unanimous consent on behalf of Congressman Rudd to enter into the record the questions that he has in writing. I also have some additional ones that I would like to ask for the record. But I would like to make just a couple of comments, if I might, and ask a couple of questions.

[The questions to be provided are as follows:]

Mr. ROYER. First of all, I did have the opportunity of sitting in on an oversight review of the waste water treatment and all of the problems that we have there, and I want to express my appreciation for many of the things that I think came out of that from an administrative standpoint that you did do, and I think you deserve public recognition of that.

That doesn't mean I'm completely satisfied, because I know that there is a firm in my district that indicated that they are backing out of this area and working in this field because of Government regulations, and that concerns me, and I want to follow up further on it.

The other question that I want to make very clear—I think the chairman did it—but I very much want to associate myself with the remarks of the gentleman from Arkansas because I underlined the same things that he did, reference your indication of the regulatory overkill, because I think it's a much more sensitive question than that.

I would like to ask just two questions at this point and then I'll file the rest of them for the record, if I may.

You've indicated on page 4 that we are developing the research "centers of excellence" in working with the universities. I wonder if you could just quickly indicate to me what progress we're having there, and also what part the private sector, those who are experts in the field, are playing in this research and development, and how it's coordinated.

Mr. COSTLE. Steve, do you want to address yourself to that?

Dr. GAGE. During the past year we've established four research centers, one in groundwater, which is handled by a consortium of universities—

Mr. ROYER. I don't think I'm asking specifically for an outlay of administratively how you're doing that. I want to know what the progress has been, if it is working, and also how it's tied into the private sector.

Dr. GAGE. Very quickly, we advertised for interest of all universities and nonprofit institutions for participation in this program. They responded. We had three panels set up to review the responses, and then selections were made. The centers are all operated at universities so we had very substantial involvement of individuals from those universities and probably from other associated universities.

Mr. COSTLE. Basically, they're just getting started.

Dr. GAGE. Yes. It's been about 4 or 5 months now.

Mr. ROYER. What part is the private sector playing in this and what information are you developing from their expertise to help you with some of these decisions?

Dr. GAGE. The research centers themselves, are university-based. They don't involve contracting for projects.

Mr. ROYER. But do they have any contact with those who are working in the area in the private sector to help? Obviously, the final determination in the final report has to be the independent report of that group making the study. But I'm just wondering how much or to what degree that's happening or do you feel it should happen.

Dr. GAGE. It varies quite a bit from area to area. In the ground-water area we have a collateral cooperative agreement with the State of Oklahoma, or with one of their water development groups, to look at what is actually going on throughout a very large area in central Oklahoma. In that instance there is very substantial involvement of all the private interests, including a number of business development groups.

In one of the other areas, in epidemiology, which, again, is only getting started, we're had very little involvement with the private sector.

Mr. COSTLE. We can provide more elaboration on that for the record.

Mr. ROYER. I would like to get that from you, and also what you feel is the responsibility of the private sector as well.

[The information to be provided is as follows:]

Mr. ROYER. With that, Mr. Chairman, I'll yield back the balance of my time. Thank you.

Mr. AMBRO. Thank you, Mr. Royer.

Mr. MAVROULES?

Mr. MAVROULES. Thank you, Mr. Chairman. I'll only be a moment. Otherwise, I would be reiterating other statements that have been made.

By virtue of my background, being mayor of a city for 11 years, the people are concerned, of course, and so am I about the rules and regulations. But you did use a term, which I was very pleased to hear, and that is cost-effectiveness, relative to the regulations.

I think you're in a "no win" situation no matter what you come up with. You're just not going to win.

But what I would like to do, and I would ask permission from my chairman and my committee, is that I would like to write to you about particular problems, not only in my area, because if they're there they're all over the country, and perhaps your response being given, not only to me but also to members of the committee, would perhaps clear up some of the questions that have been asked here this afternoon and to which we need some answers.

I come from the executive part, where the economic impact upon local government is, and that's a very, very serious problem that we face today. We talk about business; yet we're not addressing the taxpayer, the little guy out there who has to pay more dollars in view of the fact that the regulations have to be fulfilled, and I agree that they must.

My question will be perhaps in the area of flexibility of funding relative to the local communities, and I'll give that to you in writing.

Mr. COSTLE. All right, I'll be happy to get that.

Mr. MAVROULES. Thank you very much.

Mr. AMBRO. I would say that, quite frankly, I'm uncomfortable in the situation here because there are a number of questions that each of us has to try to break through this veneer of rather superficial kind of questioning and get to the heart of a lot of things that concern us. But, as we agreed earlier, maybe we can get together at some other time.

We have a motion on the floor. We have Mr. Frank here with his colleagues, and right after the vote we will come back and talk to Mr. Frank of NOAA.

While I was going to suggest Dr. Gage stick around here and see if we can get to something, I won't. I'll just say that we will have those questions that we agreed to sent to you and others developed by the committee and see if we can get some responses before our hearings on the authorization, and then at a mutually agreeable time—because there is such great interest—get together again.

Mr. COSTLE. I would be delighted. In fact, I was going to suggest that if we could get the questions and get the answers up to you before we next meet that would allow us to get to the specifics and details, and we would be happy to do that.

Mr. AMBRO. The questions follow the same tone as the questions you heard from Mr. Brown, and others, and myself except that they're more specifically geared to program and project areas.

Mr. COSTLE. We look forward to a chance for that, Mr. Chairman.

Mr. AMBRO. Fine.

We'll recess for about 15 minutes, and then we'll talk to Mr. Frank.

Mr. COSTLE. Thank you, Mr. Chairman.

[Whereupon, the committee was in recess from 3:35 p.m. until 3:53 p.m.]

Mr. AMBRO. We'll resume now.

I'm sure other members will be wandering in.

We'll now turn our attention to the National Oceanic and Atmospheric Administration, represented by its Administrator, Richard Frank.

NOAA is, of course, the lead agency for Federal oceanic and atmospheric programs, a considerable portion of which are of direct interest to this committee. Last year the NOAA budget totaled \$823.9 million, of which some \$200 million—or roughly one-quarter—was devoted to R. & D. The request for fiscal year 1981 amounts to \$820.3 million, which represents a decrease of \$3.6 million. We are most interested in hearing from Mr. Frank regarding NOAA's priorities and their related programs planned with these reduced financial resources for the next fiscal year.

In addition to purely fiscal decisions, there are several important policy questions that we will be considering as we examine the NOAA request. First, we are concerned that NOAA is increasingly moving away from its traditional research and services role toward an increased emphasis on enforcement and regulation. Whether such a shift is in fact occurring, whether it is appropriate or desirable, and whether it is an accurate reflection of congressional intent are all questions that we hope to address. We're concerned, too, about NOAA's substantially increased responsibilities in light of the limited operating resource base available to the Agency.

Finally, we must look at NOAA's budget as background to planned activities related to organic legislation for the agency. In sum, we will be attempting through this and future subcommittee hearings to gain a deeper, more thorough understanding of the priorities and specific programs that do or should comprise the oceanic and atmospheric policies of this country.

Gentlemen, we are looking forward to an interesting dialogue this afternoon.

Before you go ahead, I would like to call on my friend and colleague from California, Mr. Brown, and see if he has an opening remark or two.

Mr. BROWN. Mr. Chairman, I just want to second what you said, and to welcome the distinguished witnesses here this afternoon. I'm looking forward to discussing the program.

Mr. AMBRO. Thank you, Mr. Brown.

Mr. Frank, if you would introduce your colleagues and proceed, we would be happy to hear from you.

STATEMENT OF RICHARD A. FRANK, ADMINISTRATOR, ACCOMPANIED BY: GEORGE BENTON, ASSOCIATE ADMINISTRATOR, AND FRANCIS O'MEARA, BUDGET DIRECTOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Mr. FRANK. Thank you.

Chairman Ambro, Congressman Brown, and members of the committee: I am pleased to appear before you today to discuss in general terms our budget requests for the next fiscal year.

I do have a brief statement. I would like to read it because it is brief, four or five pages, and will provide a proper setting for discussion. I look forward to the subsequent dialogue.

I have with me today George Benton, who is the Associate Administrator of NOAA, and Frank O'Meara, who is the head of our Budget Office.

In his fiscal year 1981 budget request to the Congress, President Carter has asked for \$820.3 million for NOAA. This figure represents a net decrease of \$3.6 million from the \$823.9 million available to NOAA in fiscal year 1980. Primarily through the use of carryover balances and funding shifts within our satellite activities, we are able to show an essentially level budget while initiating over \$30 million in new programs. I would like to describe to you four major program increases which I believe to be of particular interest to this committee, and then provide you with a brief description of other budget changes. Then we can discuss any of these or other items you would like to.

In the area of basic environmental services, NOAA has requested a budget increase of \$5.8 million for fiscal year 1981 to enhance a variety of basic environmental services. These services involve obtaining surface, marine, upper air, radar, and satellite observations of the atmosphere and oceans to serve as the foundation for forecasts, warnings, and environmental quality assessments. We have requested \$1.9 million to establish and maintain a coastal and offshore automated marine data acquisition network. This network is required to replace personnel at 200 Coast Guard light stations who are no longer avail-

able to provide marine meteorological observations. We have requested \$1.5 million to expand automation of surface observing functions; \$0.4 million to augment the National Climate Program Office by funding experimental prediction efforts, demonstration studies of the value of local and regional services, and regional impact studies; and \$2 million to replace and upgrade the next-generation weather radar system. We have proposed decreases totaling \$0.5 million relating to procurement of Shipboard Environmental Data Acquisition System—SEAS—equipment, support to Pacific regional headquarters, and scheduled computer funding reductions.

In the area of Environmental Satellite Services, the administration is requesting funding for two environmental satellite systems which have a major impact on NOAA. I am referring to the Earth Remote Sensing System and the Ocean Remote Sensing System. NOAA has been given responsibility by the President for the operational LANDSAT, or Earth Remote Sensing Satellite System, and has been given responsibility, along with the Department of Defense and NASA, for the experimental Ocean Remote Sensing Satellite System. This is reflected in our request for an increase of \$3.1 million for new program initiatives. We have requested \$6.4 million to fund the initial procurement of a data processing and handling system for the National Oceanic Satellite System, NOSS, which I just mentioned, and \$0.2 million for the technical, scientific, and management support required for a future operational land remote sensing satellite system presently in the experimental phase, called LANDSAT. Because this latter figure was submitted before President Carter's decision to grant NOAA the responsibility to operate the U.S. civilian land remote sensing satellite system, we have submitted with our fiscal year 1981 budget a \$1 million supplemental appropriation request for fiscal year 1980. We have proposed decreases in the sum of \$3.5 million for programs which delay testing of certain spacecraft instruments and reduce support to SEASAT investigations.

In the area of public forecast and warning services, NOAA is requesting approximately \$3 million in extra funding for programs relating to forecasting and weather services. Approximately one-half of the increase will be devoted to a research program to investigate oceanic heat flux and its role in climate variability. This is a fundamental step in understanding ocean climate process. The remaining increase will be devoted to improving forecasting techniques to predict storm surges, improving public weather services by the expansion of NOAA weather wire services, and establishing three new ocean service units to improve marine safety and help reverse the steady rise of vessel casualties.

In the area of fleet rehabilitation and upgrading, NOAA has asked for a \$3.4 million increase for ship support services. A small fraction of this increase will provide for operations of the new fisheries research vessel, *Chapman*, and the remainder will fund a program to rehabilitate and upgrade vessels of the NOAA fleet in order to increase both its versatility and to extend its capability to the year 2000. Failure to implement a program of rehabilitation will put some of NOAA's vessels beyond the state of economical rehabilitation and could force consideration of a costly major vessel replacement program 10 years earlier than necessary. Decreases in the sum of \$0.5 million are pro-

posed to deactivate the vessel *Oregon*, and reduce maintenance required for the NOAA fleet during the period of rehabilitation and upgrade.

There are, of course, requested budget changes for a number of other programs. For example: (i) A \$1.3 million program is proposed to develop a fisheries multispecies management method and to collect and inventory marine habitat data; (ii) \$1.5 a million increase in marine technology programs has been requested for development of manned undersea facilities, and \$1.9 million to develop new techniques for long-term observations of ocean climate; (iii) a \$2 million increase is requested for the coastal zone management program to continue program administration grants for 7 additional States and territories and to augment the marine sanctuaries program; and (iv) a \$0.6 million increase in administration has been requested to augment management and operation of NOAA's new Sand Point facility in Seattle.

I believe those changes which I described to you today will provide you with an accurate reflection of some of NOAA's priorities in fiscal year 1981. I will be happy to try to answer any questions you may have.

Thank you Mr. Chairman.

[The prepared statement of Mr. Frank follows:]

PREPARED STATEMENT OF RICHARD A. FRANK, ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Mr. Chairman, and members of the Committee, I am pleased to appear before you today to discuss in general terms our budget requests for the next fiscal year.

In his fiscal year 1981 budget request to the Congress, President Carter has asked for \$820.3 million for NOAA. This figure represents a net decrease of \$3.6 million from the \$823.9 million available to NOAA in fiscal year 1980. Primarily through the use of carryover balances and funding shifts within our satellite activities, we are able to show an essentially level budget while initiating over \$30 million in new programs. I would like to describe to you four major program increases which I believe to be of particular interest to this Committee, and then provide you with a brief description of other budget changes.

BASIC ENVIRONMENTAL SERVICES

NOAA has requested a budget increase of \$5.8 million for fiscal year 1981 to enhance a variety of basic environmental services. These services involve obtaining surface, marine, upper air, radar, and satellite observations of the atmosphere and oceans to serve as the foundation for forecasts, warnings, and environmental quality assessments. We have requested \$1.9 million to establish and maintain a coastal and offshore automated marine data acquisition network. This network is required to replace personnel at 200 Coast Guard light stations who are no longer available to provide marine meteorological observations. We have requested \$1.5 million to expand automation of surface observing functions; \$0.4 million to augment the National Climate Program Office by funding experimental prediction efforts, demonstration studies of the value of local and regional services, and regional impact studies; and \$2 million to replace and upgrade the next generation weather radar system. We have proposed decreases totalling \$0.5 million relating to procurement of Shipboard Environmental (data) Acquisition System (SEAS) equipment, support to Pacific Regional Headquarters, and scheduled computer funding reductions.

IN THE AREA OF ENVIRONMENTAL SATELLITE SERVICES

The Administration is requesting funding for two environmental satellite systems which have a major impact on NOAA. This is reflected in our request for an increase of \$3.1 million for new program initiatives. We have requested \$6.4 million to fund the initial procurement of a data processing and handling system for the National Oceanic Satellite System (NOSS), and \$0.2 million for the tech-

nical, scientific, and management support required for a future operational land remote sensing satellite system. Because this latter figure was submitted before President Carter's decision to grant NOAA the responsibility to operate the U.S. civilian land remote sensing satellite system, we have submitted with our fiscal year 1981 budget a \$1 million supplemental appropriation request for fiscal year 1980. We have proposed decreases in the sum of \$3.5 million for programs which delay testing of certain spacecraft instruments and reduce support to SEASAT investigations.

IN THE AREA OF PUBLIC FORECAST AND WARNING SERVICES

NOAA is requesting approximately \$3 million in extra funding for programs relating to forecasting and weather services. Approximately one-half of the increase will be devoted to a research program to investigate oceanic heat flux and its role in climate variability. This is a fundamental step in understanding ocean climate process. The remaining increase will be devoted to improving forecasting techniques to predict storm surges, improving public weather services by the expansion of NOAA weather wire services, and establishing three new ocean service units to improve marine safety and help reverse the steady rise of vessel casualties.

NOAA FLEET REHABILITATION AND UPGRADING

NOAA has asked for a \$3.4 million increase for ship support services. A small fraction of this increase will provide for operations of the new fisheries research vessel *Chapman*, and the remainder will fund a program to rehabilitate and upgrade vessels of the NOAA fleet in order both to increase its versatility and to extend its capability to the year 2000. Failure to implement a program of rehabilitation will put some of NOAA's vessels beyond the state of economical rehabilitation and could force NOAA to consider a costly major vessel replacement program 10 years earlier than necessary. Decreases in the sum of \$0.5 million are proposed to deactivate the vessel *Oregon*, and reduce maintenance required for the NOAA fleet during the period of rehabilitation and upgrade.

OTHER CHANGES

There are, of course, requested budget changes for a number of other programs. For example: A \$1.3 million program is proposed to develop a fisheries multi-species management method and to collect and inventory marine habitat data; a \$1.5 million increase in marine technology programs has been requested for development of manned undersea facilities, and \$0.9 million to develop new techniques for long-term observations of ocean climate; a \$2 million increase is requested for the Coastal Zone Management program to continue program administration grants for 7 additional states and territories and to augment the Marine Sanctuaries Program; and a \$0.6 million increase in administration has been requested to augment management and operation of NOAA's new Sand Point facility in Seattle.

CONCLUSION

I believe those changes which I described to you today will provide you with an accurate reflection of some of NOAA's priorities in fiscal year 1981. I will be happy to try to answer any questions you may have.

Mr. AMBRO. Thank you very much, Mr. Frank.

At hearings held by my subcommittee in November you indicated that funding for NOAA's R. & D. activities is something over \$200 million a year. In a letter dated January 2 I requested that you provide, along with the NOAA budget request, a supplemental document, showing a breakout of the R. & D. programs within each of your organizational components, and the past and proposed funding levels associated with those programs. We haven't yet received that information. I wonder if you could give us a rough outline of where the R. & D. funds within NOAA are allocated and identify any significant increases or decreases in specifically R. & D. programs that are being proposed for fiscal year 1981.

Mr. FRANK. We will shortly have a response to you to that letter, Mr. Chairman. I would have liked to have had it to you before this hearing. We did receive it on January 16, and I'm sorry the amount of time necessary simply didn't allow us to provide it to you.

It would be difficult for me to talk about the specific R. & D. amounts orally. I think it would be better, both for you and for us, if you had it in writing.

In terms of the increases in those activities, the major increases are those I have mentioned in my statement. We could discuss any of them you would like. That is, to the extent there have been major increases in research they are outlined in the statement. I am happy to repeat them, but I think you do have them, and perhaps we should focus on any particular ones that are of interest to you.

Mr. AMBRO. Two simple things arise from that response. One is that maybe in the future we'll hand-deliver a letter to you, because you say you got it on the 16th. That's two weeks later. That's about what I tell my constituents when I respond to them.

When do you think you will have that information together so that we can receive it?

Mr. FRANK. Within a matter of days, sir.

Mr. AMBRO. All right.

Neither the general budget information you've provided nor your statement addresses personnel figures of the agency.

Did your overall personnel ceiling change significantly for fiscal year 1981?

Mr. FRANK. No, sir. We do not have a final figure from OMB to the Department of Commerce yet. But it is my projection that our overall figure will not change significantly. We will still be around 12,836 individuals. That's full-time employment. There are about an additional 2,000 considered as part-time employees.

Mr. AMBRO. Are there any major shifts of personnel within the agency for fiscal year 1981?

Mr. FRANK. The shifts in personnel that will take place will be minor. That is, we will not have major shifts. I do not forecast a shift of anything more, for example, than 20 here or there. We will increase the number of people working on the LANDSAT program and on the NOSS program because those programs are new, and we would expect to be authorized new hires in connection with the earth remote sensing program. There are some efficiencies, in terms of use of personnel, which we have mentioned in the budget. We are undertaking a program to see what further efficiencies, through decreasing lower priority programs or through contracting out that can come about so that we can free up personnel to undertake new programs.

Mr. AMBRO. Is there a particular proclivity on the part of the agency for hiring attorneys into senior staff positions?

There has been, for example, so far as we can determine, an increase from about seven, three years ago to about fifty attorneys in NOAA today in senior positions or in the office of the General Counsel.

What accounts for that?

Mr. FRANK. I'm not sure precisely what those figures are. That may be the size of the General Counsel's office, which when the agency was formed in 1970 was a handful of lawyers. At that time we did

not have the kinds of responsibilities we have now. Our statutory responsibilities have increased immensely in certain areas, which require lawyers. For example, under the Fishery Conservation and Management Act a number of the regulatory, developmental, and management activities have involved lawyers to a great extent. The person who has wanted those lawyers even more than the General Counsel in NOAA has been the Assistant Administrator for Fisheries because he is the client and needs them. There has been a substantial increase in the number of lawyers in the General Counsel's office because of the change in the nature of our programs and also because of the increase in the responsibilities.

There have been, in addition, individuals with legal degrees who have joined NOAA at higher management levels. NOAA originally was a science organization and, quite properly, was composed primarily of scientists. Because of the enactment of laws like the Fishery Conservation and Management Act and the Coastal Zone Management Act, and because of new responsibilities like deep seabed mining, and responsibilities in the law of the sea, we have a different kind of agency, which, I think, requires an interdisciplinary approach to these problems.

Let me give you an example of where we have made some changes.

I have stressed the hiring of economists. We have been given responsibilities in the fishery development area, and now that office is headed by an economist who I think is outstanding. I think it is important in the fishery management area to have an interdisciplinary approach also. Aside from the lawyers in the General Counsel's office, I think it is important to have managers who are marine biologists and also economists because every management plan affects the resources and the industry economically. There will be economic criteria used in management plans, so it has to be interdisciplinary at that point.

In the Office of Coastal Zone Management—

Mr. AMBRO. Before you get into that, I'm enthusiastic about interdisciplinary approaches to a variety of things, but maybe you could describe in layman's language what a fisheries multispecies management method is. What does that mean in English?

Mr. FRANK. We originally formed our management plans on the concept that you should look at the particular species, or stock, that you're dealing with and try to project its growth and its population increase. Most scientists, outside NOAA and inside NOAA, in marine biology have concluded you can't just do that. What you have to look at is the large number of species, that is, multispecies, that may be involved in any particular area, because what happens to one species affects another species. If you overfish a predator, for example, then the fish that would be consumed by that predator can increase in stock size. If you overfish one stock, other populations may replace it in terms of space. There are all sorts of interactions, in other words, among species, and in order to make projections for any particular stock you have to look at all the species.

In addition, there is some feeling by a large number of people that if we're going to manage fisheries, since a lot of fish are caught at once and you can't often go after just one kind of fish, you may need to establish quotas taking into account all of the species, rather than just one species.

Mr. AMBRO. Is there an interface with wetlands with respect to that?

Mr. FRANK. Absolutely.

Mr. AMBRO. As breeding grounds for smaller fish?

Mr. FRANK. Absolutely. Wetlands are extremely important because the estuarine areas are really responsible for producing either the populations themselves or the food for 65 percent of our commercial catch. So wetlands are important, estuaries are important, and we have programs in those areas.

Then we get into the issue of habitat protection, being sure that development is sound and in the right area. We are also involved with pollution control.

Mr. AMBRO. So the answer to the question, which infers an inordinate increase in attorneys over the last 3 years, you're suggesting then that really that is not the case?

Mr. FRANK. I believe it is not inordinate. I have not really looked at individuals from the point of view of their specific training, although I do want to encourage individuals with many kinds of skills to join NOAA. We have hired individuals based on their competence. If a person happens to have a legal background, then so be it. It turns out that the Assistant Administrator for Fisheries was once a lawyer. Before him it was a person who was once a marine biologist. The next person might be one who was once an economist.

Mr. AMBRO. So it is possible, in your view, that an attorney can be technically qualified to manage fish?

Mr. FRANK. Yes, sir. I think that an attorney can be qualified. An educator could be qualified to manage fisheries, for example. I think an attorney could be qualified.

Mr. AMBRO. We're told that NOAA's headquarters budget has grown by six percent in real terms in the last three years, while, for example, the field operations and the labs have suffered significant budget reductions in force in the name of staff ceilings. That would represent, adjusted for inflation, almost a 50-percent growth in headquarters.

Aside from the arithmetic or taking issue with that the six percent in real terms is accurate, what's your comment about the relationship between the growth of the headquarters budget and the concomitant reduction of field operations? Is that an accurate or an inaccurate assessment?

Mr. FRANK. I'm not even sure one can make that kind of a comparison because we have changed and reorganized NOAA so that headquarters now is not what headquarters once was. We used to have a system with two Associate Administrators, who were staff officers, who performed some line and some staff functions, and we had a variety of what were called principal units reporting to the Administrator.

We have now changed that so that the Assistant Administrators have a line responsibility. We have also developed a Policy and Planning Office. We have developed a Civil Rights Office. The Civil Rights Office used to be part of the Office of Administration, which I do not think is part of the Office of the Administrator for the counting purposes you've engaged in.

So we have moved civil rights from one part of NOAA to another part. The budget of the other part, which is probably called the Office of the Administrator, has increased. I'm not sure, however, that that

makes any difference in anything except the placement of that office. That person now reports directly to me, which we thought, in order to enhance our EEO responsibilities, would be a wise thing to do.

Mr. AMBRO. I think your answers are responsive. I don't know that it makes a difference either. I think, though, when we look at our figures on line items and we're unable to see how these things balance out we have to ask questions. Your answers appear appropriate.

Mr. FRANK. Let me mention one other thing, Mr. Chairman, if I may.

There has been a conscious decision on our part, whether right or wrong, to use a substantial portion of NOAA's funding for outside research, that is, research by the university or outside research community not connected with universities. We're doing this for a number of reasons. But the impact of that may be to reduce slightly the number of research entities or persons doing research in NOAA. That's a very conscious decision. We're doing it because we believe in some areas the best talent can be found outside the government; we're doing it because we do have ceiling allocations problems that you mentioned earlier; and we're doing it simply because we believe our relations with that community will benefit and that it will be more efficient to do it outside. If we do do more research outside—it's not been our habit to do that in the past—on contract to us, that means we can free up spaces in certain laboratories. I think some people will resist that; some people will be legitimately concerned about it; but it has been our decision to do it.

Mr. AMBRO. Do you have a public relations component as well as a civil rights component?

Mr. FRANK. Yes, sir.

Mr. AMBRO. How do you talk to people like Jack Anderson and major TV networks who do a series on the hidden government, and explain the relationship between contract work and the numbers of people that are on the payrolls. They seem to think that this whole business of moving in the direction of contracts to qualified universities and scientists is something that is subversive and some kind of coverup.

Why don't you make the point more forcefully through your PR people?

Mr. FRANK. I would be happy to do that, sir.

Mr. AMBRO. Just a suggestion.

In line with what you say and what I've said with respect to looking over the budget, you say that there is over \$30 million allocated for new program initiatives.

When we reviewed the budget summary we received on January 28, the total increases requested comes to \$32.2 million. These increases apparently include old programs as well as new programs.

Is there any way, off the top of your head, that you can provide us with a breakdown and tell us how accurate the statement is concerning new programs? Is all of that \$30 million for new programs?

Mr. FRANK. I think we might get into a semantics problem but I would be glad to help as I can.

"New programs" is a term of art in the appropriation process, meaning really new moneys, which may be new moneys for programs that were existing or entirely new programs.

I can describe to you some of the programs which I think are entirely new, but even there we get into a problem. For example, the NOSS program, the ocean remote sensing program, for which we are asking \$6.4 million, is new. On the other hand, formerly there was the Seasat program, which was operated by NASA. One could consider NOSS old, and a follow-on to Seasat, and, therefore, not a new program. We are considering that a new program from the point of view of this budget.

Landsat is a new program, and we have \$1.2 million in the budget for it but some of that is not new money; that is, some of it was in the 1980 budget. Some of it will be increased in 1981, and, as I mentioned, I foresee a budget amendment, or something of that sort, for 1981 in connection with Landsat.

I could go through the rest of these programs and try to identify those which are entirely new, but even there we're going to have to have qualifying language. I don't want to mislead you on that.

Mr. AMBRO. Maybe we'll work that out with staff.

I just want to get to one more line of questioning, and then I'll turn it over to Mr. Brown.

With respect to research and services, as opposed to the enforcement and regulation responsibility, when originally formed under the reorganization in 1970, NOAA was charged with responsibility for all nonmilitary research and services related to oceans and the atmosphere.

It's been suggested in recent reorganizational and draft charter documents that NOAA's past emphasis as a research organization be reoriented in favor of a regulatory and enforcement emphasis.

Do you believe this should be the future thrust of NOAA, that is, a thrust from research and services to regulation and enforcement?

Mr. FRANK. I don't think there should be a shift. I do believe that we are, and should be, more than simply a research and services organization, and I think Congress has already decided that by mandating it.

For example, when Congress passed the Coastal Zone Management Act and gave us responsibility for implementing it, it decided that we would be in the position for the Federal Government of establishing coastal zone management policies and attempting to induce States to adopt plans themselves.

When Congress passed the Fishery Conservation and Management Act, it decided that NOAA would do more than fishery research; it would do fisheries development, fisheries management, fisheries regulation, and fisheries enforcement.

The President has decided that we would be lead agency in deep sea mining, and the Senate has passed a bill which would give us deep sea mining science, development, and regulatory responsibilities. I believe that bill, or a similar bill, will be before the House this spring.

So I think Congress has decided that we should be an agency with a variety of activities in the oceans and atmosphere area. I personally think that is good because I think it is bad to separate totally science from development and regulation. I think that the organization and the regulators and those interested in development benefit from being near scientists and, at the same time, the scientists conducting R. & D. and services benefit from being near the others because I think then

their science will be more oriented toward the needs, for example, of fisheries management.

Mr. AMBRO. Have you anticipated a greater focus on the enforcement and regulation responsibilities of NOAA in the upcoming budget? How has the percentage of funds allocated to each of these general areas changed over the past couple of years, and how is that reflected in this upcoming budget?

Mr. FRANK. If I could be broader than that and talk about the next couple of years, for example?

I would project that the overwhelming amount of our increases will be oriented toward R. & D. and the development of satellite systems, both the Earth remote sensing satellite system and the ocean remote sensing satellite system. Part of it will be research, even though NASA will be doing the preliminary research. Part of it is services, in the sense that we're operating the system. A purpose of the system is to provide management and development information.

Mr. AMBRO. There's no question that the Earth and ocean remote sensing satellite systems are exciting to us. We're enthusiastic about it, and we know you are too.

Before getting to another line of questioning, I would like to defer now and ask my friend, George Brown, to take it.

Mr. BROWN. Thank you, Mr. Chairman.

Obviously, Mr. Frank, we can't comprehensively cover all aspects of your organization in a brief hearing like this, but there are two or three items of particular interest to me that I wonder if you can elaborate on a little bit.

The matter of your new responsibility for the land sensing system, Landsat, could you explain to me in a little bit more detail just what that transfer of responsibility entailed, and what additional burdens and responsibilities and resources might be ultimately included in that?

Mr. FRANK. Ultimately we will be operating and managing the Earth remote sensing satellite system, except that it is our eventual desire that, as the President has decided, it would be operated by a private entity. Some of the responsibilities include preparing a plan by June 1 for the transition into an operational system. Part of that responsibility involves interagency coordination with the other agencies that are involved; namely, the Department of the Interior, the Department of Agriculture, the Department of State, and NASA.

Mr. BROWN. Is that \$200,000 that you've indicated basically for that purpose?

Mr. FRANK. That will be more for the management infrastructure to run the system.

Mr. BROWN. You have that, and you're asking for a million in supplemental appropriations for the current year—this is also for that determining process?

Mr. FRANK. That is correct. We will also be asking for a substantial amount more. I consider this to be a very small amount compared to what the ultimate system will cost. The ultimate system is in the hundreds of millions of dollars, and most of those funds will be toward the satellite itself, its sensors and ground stations, and the ground system. The operational cost, in terms of manpower, will be modest compared to the cost of the hardware. We will need additional people for the running of the system, and we will need substantial additional resources to procure it.

Mr. BROWN. Can I presume that NOAA will take over the existing ground stations, the ones that read out the data, for example, the distribution system at Sioux Falls?

Mr. FRANK. Yes, sir. We will be taking over what we call the pre-processing ground stations, that is, the ground stations that receive the information. We are going to integrate this to the extent we can with our present system.

There are, then, ultimate distribution networks, for example, the EROS system, run by the Department of the Interior. It is unclear whether that will continue to be operated by the Department of the Interior because it's by no means clear that we would have to operate that system. That is, it is perfectly possible, in fact, perhaps preferable, for a department like the Department of the Interior to continue to operate its final processing and distribution network.

Mr. BROWN. To what extent, when you have all of the systems in place—the Landsat system, the NOSS system, and your existing weather satellite system—do these make up a system which is integrated in the sense that it can be managed as a unit and that can take advantage of any economies as a total?

Mr. FRANK. That's a very good question. I think one of the reasons that NOAA was given the responsibility for the systems was because we had already run the meteorological system and it was felt that if one civilian agency were to run all of the civilian satellite systems that were operational, there could be economies, and we do project that.

Ultimately it is possible that we will not have a Landsat or NOSS, that we will not have separate satellites, but that we would go in for the efficiencies and economies of scale, both in terms of the management and operation of these satellites. You might have one satellite with sensors performing all these different functions.

There are a number of questions which come up, some of which include our present responsibilities. If there is to be a handoff of this system to the private sector, how would there be integration with that private sector entity and what would be the residual responsibilities?

To amplify further what our responsibilities are, we are involved in discussions with potential manufacturers, potential operators, and users of the system in developing the June 1 plan. We are also going to be involved with foreign governments because, as you know, foreign countries make use of these systems.

So there will be a number of responsibilities for us in addition to those of just developing and managing the system.

Mr. BROWN. There's no technical reason why you couldn't have one system of satellites? By that I mean more than one satellite, but all of them integrated in terms of some uniform design of the sensors so that they produce the total data that is required for all of the purposes.

Mr. FRANK. I'll ask Dr. Benton to amplify, but I think the short answer is, there is no reason why we could not do that, and we are going in that direction.

Dr. BENTON. I believe it will be possible to gain a lot of efficiencies in terms of the design of a system for Earth remote sensing. Any one satellite could carry a number of sensors. I believe the ultimate system that would develop, if you were designing a system to look at the Earth in all its aspects, would undoubtedly place sensors aboard

spacecraft in terms of orbit selection whether it happened to be land oriented or meteorologically oriented. This, I think, will improve efficiency.

For the immediate satellites that are developing now, we will still have a substantial separation of sensors, according to the label of the program, because these programs are evolving parallel and not in the same timeframe. In the long run it's inevitable that they will become consolidated and that these kinds of orbit efficiencies will be developed.

Mr. BROWN. We have a similar problem with the communications satellite, in that we are moving in the direction of deploying satellites that, in effect, become multiple antenna farms in space for communications purposes.

My basic question is: To what degree is there some unified planning going on with regard to these systems that insures that we don't have different agencies planning different programs without considering the possible integration of the systems?

Dr. BENTON. As Mr. Frank indicated, I believe that the realization of the possible efficiencies here was a strong motivation for the placement of the responsibility for land remote sensing in NOAA. We are well aware of these possible efficiencies, and we are seeing to it that in the development of a new system such as the land remote sensing satellite system, steps are taken to preserve flexibility for future consolidations.

Mr. BROWN. Let me go to the data processing aspect of this.

I notice that in your statement, Mr. Frank, you have requested \$6.4 million to fund the initial procurement of the data processing and handling system for NOSS. You already have a highly complex data processing system for your existing satellite.

Could you elaborate a little bit on what you are looking for here, and how that will be integrated with the remainder of your system, and are you contemplating in the future data handling systems that will have, say, an order of magnitude increase in the data that's coming in and maybe an even greater order of magnitude increase in the user community for these data systems? To what degree are we making plans that incorporate these possible future systems?

Dr. BENTON. Mr. Brown, the planning is underway for the land remote sensing system and, therefore, I can't really say that this process is complete. I would like to remark, however, that we're very keenly aware of this problem and NOAA is thinking in terms of building data reception systems, for example, for NOSS or for the land remote sensing system which are collocated if at all possible with our meteorological receiving systems so that future flexibilities can be achieved. The planning has not yet moved forward to that stage, but that is certainly something that is very much in our minds.

Mr. BROWN. What are you going to buy with this \$6.4 million, and on what kind of a time schedule? Can you give me an indication of that?

Dr. BENTON. This provides ground receiving equipment for the National Ocean Satellite System, and provides a capacity which is not now available in our meteorological receiving system. It's the first step toward what's going to be an extremely large and extremely complicated system.

Mr. BROWN. All right.

Mr. FRANK. Mr. Brown, \$3 million of that is for the satellite itself and \$3.4 million is for the ground system. We can break that down further, that is, the allocations from the other agencies toward those two systems, and how we have arrived at those figures.

Mr. BROWN. I would just like to have a little better picture of where we stand with the systems, and what we hope we're building up to, and how they tie in with other systems that other agencies are developing, and my concern is in being able to identify sufficiently the details of what I'm talking about to make a comparison.

Mr. FRANK. We will do that, sir.

You did ask earlier whether we envisioned orders of magnitude increases in data information, and we do. We also envision increases in the number of users. We're going to try to stimulate the users. That is, I think the more users there are, the more people who can make benefits of this. Also, the more economical the system is, the better off the country is by having the benefits of this advanced and very innovative technology.

Mr. AMBRO. I think what we're going to do, Mr. Frank, Mr. O'Meara, and Dr. Benton, is run down and vote, and we'll be back in about 7 or 8 minutes.

[Whereupon, the committee was in recess from 4:36 p.m. until 4:50 p.m.]

Mr. AMBRO. The committee will be in order.

I'm going to call on Mr. Brown to resume his questioning.

Mr. BROWN. Leaving the satellite program, Mr. Frank, I notice that you refer to an increase of \$3 million for programs related to forecasting and weather services, with about half of the program increase for investigating oceanic heat flux and its role in climate variability.

This is an important area, related to a number of significant problems at the present time, and I wonder if you could give me a little bit more information on that, and also, in light of earlier questions, as to where the research would be performed, that is, within house or contract, or what is the arrangement?

Mr. FRANK. In light of the latter part of that question about where the research is going to be performed, I would like to ask Dr. Benton to respond. He has been responsible for implementing our program, which I mentioned to the chairman a minute ago, of having research be done outside NOAA in outstanding university and academic institutions.

Dr. BENTON. This program is oriented toward evaluating the role of the oceans in the transport of heat toward the Pole. Recent advances in oceanic instrumentation and in ocean sampling have made it possible for the first time to be able to go into the oceans and to statistically sample the heat transport and the energy transport in ocean currents to determine the flow that takes place in the ocean, the parts of the ocean that it takes place in, and its contribution to the total climatic balance of the Earth.

This has not really been done in the field up until now, and this is part of an effort undertaken by our research and development organization in close cooperation with the academic community to try to launch such a program in the Atlantic that requires a very careful sampling, a lot of fieldwork, some very careful efforts. We don't know

for certain that it will be successful, but we think there is a very good chance that present technology will yield important results here.

Mr. BROWN. Are you using automated buoys as a sampling system in part?

Dr. BENTON. Yes. But this will also involve actual measurements from ships.

Mr. BROWN. And you mentioned the academic community will be involved and actually doing the research?

Dr. BENTON. Yes, sir. They are very heavily involved in the planning and will be very heavily involved in actually carrying on the research.

Mr. BROWN. Is this research in any way related to the fluctuations and the ocean's capability to pick up CO₂ with variations of temperature, or is that separate?

Dr. BENTON. It will be related, but not directly. This is primarily an energy balance study. Obviously, to the extent that we gain information on the ocean's circulation this will certainly contribute to our understanding of the capability of the ocean to absorb carbon-dioxide in surface layers and transport it to the lower elevations in the ocean. So it is related, yes.

Mr. FRANK. Mr. Brown, also there is another item of relevance to this. That is, there is a \$900,000 item which is related to the development and purchase of instrumentation to assist in the heat flux program.

Mr. BROWN. I am eager to understand the thrust of these programs against the same features that I mentioned with regard to the satellites.

Who is going to tell me about the National Climate Program Office?

Mr. FRANK. We can both speak to that. What question would you like to ask, or is that a general question?

Mr. BROWN. I'm leaving you a lot of leeway.

I understand you are asking for \$400,000 for the National Climate Program Office, and we haven't received a national climate program yet, which I understand will also be forthcoming.

I'm sort of interested to know what we're doing and what we expect will happen with the program in the forthcoming year.

Mr. FRANK. We'll be happy to provide you with a copy of the plan. We will have that plan to you before the spring has arrived, that is, within a couple of months. A good deal of revision has taken place, and rethought on some of the issues as a result of the extensive consultation with the outside community.

That \$400,000 is being used for the programs that are mentioned there, that is, experimental prediction efforts and to demonstrate studies of the value of local and regional services, and also studies relating to impact.

When the draft originally came out there was a suggestion that too much of the funds involved were being used for basic research, as opposed to being used in these areas, and I think we are going to reorient, to a certain extent, the moneys that will be used. The plan is being changed accordingly, and these funds will be used for related programs.

Mr. BROWN. In my layman's perception, from the previous discussion with regard to the money for the heat flux investigation, it seems to me to be related to the climate research program. Is it officially and

formally included in the plan, or does it just happen to be something interesting that you're doing on the side?

Dr. BENTON. It will be included in the plan, yes. This is part of our effort to try to understand the role of the ocean in climate.

Mr. BROWN. I'm not questioning the importance of it.

Dr. BENTON. It will be in the plan.

Mr. BROWN. It will be a part of the plan?

Dr. BENTON. Yes, yes.

Mr. BROWN. That's what I'm interested in.

Let me just ask you one or two other questions.

We had testimony this morning from Dr. Atkinson about the proposed new initiative in the NSF having to do with deep ocean drilling—actually, not deep ocean drilling, but ocean margin drilling. It's contemplated to be a 10-year, close to a \$1 million program, with some very interesting aspects.

To what degree has that program been discussed, planned, or coordinated between NSF and NOAA?

Mr. FRANK. That has not been a program which has been extensively discussed with NOAA. That is a program of other agencies, the USGS, NSF, and the like, and we really could not speak to it. It is not being done with our funds and it is not even partially our program.

Mr. BROWN. It is a matter of any interest to NOAA?

Mr. FRANK. Yes, indeed. I suppose it relates to an earlier question of the nature of our mandate and our activity. We might well have been involved in this subject. We are interested in seeing it progress. It's an intriguing program. But because it, to a great extent, relates to oil and gas USGS has been involved and NSF has been involved.

Mr. BROWN. Because it relates to the bottom of the ocean, not the top of the ocean?

Mr. FRANK. I don't know that that distinction would leave us out. We have been given the responsibility for deep sea mining, which is very much at the bottom.

Mr. BROWN. That's right.

Mr. FRANK. We are just not involved in this particular program.

Mr. BROWN. I don't think there's any great harm in that, but I am interested in the processes by which decisions as to the management of major programs that appear to be related to different agencies are developed. It would seem to me that a program involving ocean drilling, ocean resources assessment, and ocean technology should be discussed with an agency involved in those programs already. If it isn't, it seems to me that perhaps we are not properly integrating the planning process. That's the point of my question, and it may well be that proper integration of the planning process would provide the same results, that the same decision would be made. But I have a personal bias that improved planning and interdepartmental consultation results in a better program in the long run. This is no reflection on the NSF, which has been conducting a predecessor program, so there is logic in what is being done. But this does represent a major new initiative, with considerable applications in several fields.

Mr. FRANK. I think your point is well taken. I think better coordination within the government would have led to our more intimate involvement. We have discussed the subject with the other agencies.

I think what happened in this case is that since it was primarily oriented toward marine geology, and the USGS has been more involved in that than we have, it was thought of as the mission agency and we were not. There was some question when reorganization of natural resources agencies was being discussed whether the distinction between marine geology being performed in one area and other oceanographic research in another area was the best way to structure the government. I was of the view that it was not, and, indeed had reorganization come about, an amalgamation may have taken place.

Mr. BROWN. Another similar question: There frequently comes up in a different context the question of whether a research and a regulatory organization ought to be combined, or the functions ought to be combined within the same organization.

We asked this earlier, or we asked questions related to this, of Mr. Costle of the EPA. Obviously, there are a number of areas in which EPA and NOAA are engaging in research of an environmental nature. I don't know that there's any imminent possibility of this, but I'll ask you the question whether it is conceivable in your mind that we would be able to have a better integrated environmental research program if that function was included with the environmental research programs now being done by your agency.

Mr. FRANK. If their programs were, sir? Are you speaking about their programs?

Mr. BROWN. Yes. Or ask them if they think your programs ought to be transferred over to their agency.

Mr. FRANK. You might get different answers if you ask them, than those you would get if you ask us.

That is a very intriguing question of whether research should be with regulation, forgetting the two agencies for a moment.

On the one hand, as I mentioned before, I believe research becomes more mission oriented if there is a relationship between the research entity and the entity which uses that research.

When we were considering a reorganization in 1977, we considered moving the research part of the fisheries service away from that entity. We concluded that there was not a problem in the way the research was being done for the management programs and that the integration and the closeness were a good thing.

There is always the possibility that if a regulatory agency does the research then the research gets skewed and may not be as objective as it otherwise would.

I think that there is no ultimate answer to that question. A lot of it would depend on the relationship between the various parts of that agency if they were to be combined. As of now, I do not see a problem in NOAA.

It came up as a major issue when we were considering putting NOAA together with the Department of Interior, with the latter having developmental responsibilities in the oil and gas area, and us having research responsibilities in connection with, for example, the protection of habitat for fisheries. We didn't know the answer precisely. We thought that there could be some benefits. But we wanted to protect against any kind of biases that would be in the end detrimental.

Mr. BROWN. Basically, I am looking to protect the necessary research that needs to be done by the Government. The way things go

sometimes it would appear that EPA might be a primary candidate for extinction as an Agency of the U.S. Government. I'm not predicting this, but the fact is that your Agency has probably a more comprehensive system of monitoring the environment, both land and sea, than any other Agency.

I can conceive of an arrangement whereby this overall environmental monitoring function would be unified and coordinated in one agency. Possibly the health effects aspects of that research could be coordinated in one of the several health agencies that are involved in this kind of research. The remaining regulatory functions that the Congress and the Executive see fit to keep might be handled in some other fashion.

If that should ever come about I think we need to examine the question of where this activity would be most effectively placed within the organizational structure.

I am not particularly pleased with the speed with which EPA—and I'm not blaming them for it—has moved in the direction of a long range, comprehensive research type of approach to the problems that the environment faces. Part of the problem may be that their proximity to the regulatory function and the fact that they are not a comprehensive agency. They work with targets of opportunity, or pressure, or whatever you want to call it, which causes them a great deal of problems.

Mr. FRANK. I might mention that I have been a strong advocate of our having the primary, if not the sole, responsibility for ocean research. I think it would be unwise for EPA to try to develop that capacity to a great extent because we already have it and there would be a duplication.

On the other hand, I think NOAA historically has not been adequately responsive to EPA's needs. I think that there was criticism of us that we were not enough mission oriented, at least for their missions, and I hope we have now resolved that.

Dr. Gage, who is here, is now on an interagency committee that is chaired by our Deputy Administrator Bud Walsh, and that committee is looking at marine pollution and marine research across-the-board. I think that there has been substantially better interaction between us and EPA in that area, and that we will both benefit from it. They will benefit because we are doing a better job in orienting our research toward their needs.

Mr. BROWN. This whole question of shifting of organizational boxes is a rather superficial approach to the fundamental problem. That problem is adequate flow of data and information to meet the needs that may exist for it, and that can cut across organizational boundaries, but sometimes doesn't. The point that you made about the interorganization coordination may be an answer to that. I don't know. But up to now I don't think we've been satisfied that we have the best possible answer.

Mr. FRANK. I think you are right.

There's another interesting issue you may want to know about. With respect to fish health and safety, it is the FDA which is responsible for establishing standards, not us. We are responsible for a good deal of research in the area. We also do fisheries management and the fishing industry development. But we do not do the health standards. That's done by FDA.

On the other hand, with regards to meat inspection the Department of Agriculture has both the responsibility for developing the industry and regulating the meat industry and establishing the health standards. The result was in one case that the same amount or percentage of a certain toxic material in beef was okay, whereas if the same material was in fish it wasn't okay.

Mr. BROWN. That's part of the information flow problem.

Thank you, Mr. Chairman.

Mr. AMBRO. Thank you, Mr. Brown.

Dr. Benton, you mentioned collocation before. I wonder if, just to answer one question on a specific item, what's the status of the proposal to collocate the Great Lakes environmental research lab to the University of Michigan? Do you know?

Mr. FRANK. Let me try to respond if I may. I'm not even sure if it qualifies as being a proposal. It may be a gleam in someone's eye.

Mr. AMBRO. Why don't we ask you to look at it and when you get an answer submit it?

Mr. FRANK. I'll be happy to.

Mr. AMBRO. I have a series of questions from the chairman of the committee, Mr. Fuqua, that I would like to run through, and, again, if you prefer maybe we could submit these in writing, but if you have the answers I think he would like to know what they are at the outset.

As a result of the recent Presidential Directive 54, which creates an operational civilian satellite remote sensing system within NOAA, will the end user community, including the nonrenewable resource, the private sector, have meaningful participation in the policy, operational and private sector involvement decisions of the system governing the program board?

Mr. FRANK. I think the answer is absolutely. We have included that sector, through official notice and informal contact, in the decisions relating to the plan I referred to which is due June 1. It will be our objective thereafter to have them involved in decisions relating to the system. Just exactly what their involvement will be after June 1 is one of the subjects of the June 1 plan, which they are involved in the preparation of.

Mr. AMBRO. With respect to Presidential Directive 54, what mechanism under that Presidential directive guarantees that NOAA will, in fact, move towards meaningful and valid private sector involvement? Is there any?

Mr. FRANK. We are having workshops now and we are in consultations with that community already so that they will have an opportunity to comment on our drafts of the June 1 plan. It is everybody's desire, and I have seen nothing to the contrary, that they be very much involved afterward.

Mr. AMBRO. So that, if I can improvise here, there is not a structural requirement under the Presidential directive, but the mechanism is evolving as a result of universal agreement which would exist. Is that what you're saying?

Mr. FRANK. Yes, sir.

Mr. AMBRO. Where within the U.S. Government does the charter responsibility exist for support before OMB and the Cabinet for the development of exploration technology, such as SEASAT and other satellite remote sensing systems, which, on a global basis, may

assist the United States in basic, nonrenewable resource discovery and acquisition over the next several decades?

Mr. FRANK. Perhaps Dr. Benton can best answer that. I'm not sure, in terms of mandate, where it is, outside the document you just mentioned. We have the mandate. NASA has residual responsibilities which would continue until the handover to us occurs.

Mr. AMBRO. The question asked about a charter responsibility, where does that exist within the Government?

Dr. BENTON. Mr. Chairman, in my discussions with representatives of the private sector who are concerned with the development of nonrenewable resources on a global basis, it has emerged very clearly that the lack of an agency with such a clear mandate is a very serious concern to them. I don't believe, from these contacts, that I can say that such a clear mandate exists in any agency.

Mr. FRANK. By the way, Mr. Chairman, I think ultimately there will be legislation regarding remote sensing which may be very comprehensive. That might be an ideal place to see that a clear charter of that nature is written into law.

Mr. AMBRO. It may very well be that that's what this line of questioning anticipates.

As a result of the recent assignment of NOAA as the lead Agency responsible for operations of all civil remote sensing systems, what amount of money is needed in the current fiscal year, the 1980 budget, to support these activities?

Mr. FRANK. \$1 million is the fiscal year 1980 budget. We have a slight increment, which we referred to earlier, in the 1981 budget. We anticipate that there will be a budget amendment, which would ask for additional funds in the fiscal year 1981 budget.

Mr. AMBRO. When do you plan to submit the fiscal year 1981 budget amendment to support these activities?

Mr. FRANK. I would think by this spring, as soon as possible.

Mr. AMBRO. Do you need new legislative authority to proceed with your new role? You've answered that in part, I think, already.

Mr. FRANK. Whether in fact we need it from a legal point of view, it is our view that we ought to have it. Congress ought to speak on the subject. I personally believe that there should be some indication by authorizing committees that an operational Landsat is the right thing to do. I think ultimately, although not immediately, we will also need more comprehensive legislation so that the kinds of policy issues you are raising in these questions can be discussed in a hearing forum, and then decided on, to the extent it's proper, by Congress.

Mr. AMBRO. Then NOAA would support an approach whereby the committee would introduce an authorization bill for the total 1981 NOAA budget request?

Mr. FRANK. I'm really not authorized to speak for the administration on whether we would support it. That is a subject I would be happy to discuss within the administration. I think that there is a substantial reason to have it.

Mr. AMBRO. The last thing I have, I just want to get back to this business of enforcement and regulation responsibilities once more.

I don't know that I understood completely what you said about moving in the direction of enforcement and regulation responsibilities,

especially in view of the fact that in the enforcement area we do have certain organizations which do that kind of work. One that quickly comes to mind is the Coast Guard. Did you say that you are anticipating a broader mandate from Congress in one form or another in the area of enforcement and regulation?

Mr. FRANK. I believe we do have that mandate already, sir. You're talking about the Coast Guard. The Fishery Conservation and Management Act did provide for us to have enforcement responsibilities with respect to fishery management plans. We undertake those responsibilities in collaboration with the Coast Guard. Most often, for example, their vessels and officers are used. But we are also involved in the enforcement mechanism. For one thing, you need marine biologists if you're going after a fishing vessel to find out what fish it has and what they are doing. It is our enforcement agents who are involved in the prosecution of those acts.

Under the deep sea mining legislation which has been passed by the Senate, I would imagine that there would be enforcement responsibilities and, again, we, as a deep sea mining agency, would have those responsibilities. We might, for efficiency purposes, use Coast Guard vessels and planes to assist us, but we would do it.

Under the Marine Mammal Protection Act and the Endangered Species Act we have enforcement responsibilities. In those programs we are doing the work primarily without Coast Guard assistance, but if it should turn out that Coast Guard assistance would be necessary we would use it. Also under the Whaling Convention Act we have enforcement responsibilities.

Mr. AMBRO. The thing I can't fathom is that you have research and services responsibility on the one hand and you have enforcement and regulatory responsibilities on the other. Over the past several years you've been given responsibility for administering a number of new and modified legislative and executive initiatives, such as the National Climate Act, the Marine Mammal Protection Act, the Presidential directive transferring the satellites, and things of that nature, and yet in a review of your budget, or at least your personnel or what we know of your budget, we are now impressed by the thought that you're moving at least 50 percent of all of your activities in the area of enforcement and regulation.

If that's accurate, how can you do this, given your traditional activities on the one hand and, on the other, not only maintain but even diminish budgetary levels with respect to personnel? Are those budgets realistic, or are you going to pull personnel from traditional, accepted congressionally mandated services?

I would like to get some expression of how this seesaw works. It doesn't make sense at the moment.

Mr. FRANK. I think that the 50-percent estimate is quite skewed. It is not near 50 percent that has gone toward regulation and enforcement.

For example, in the area of fisheries enforcement, our budget includes an item of only \$6 million.

Some of our funds are now going toward management and enforcement, and it could also be called regulation. We have gotten substantial increases in funds over the years for those programs.

In terms of the area that we have had most difficulty in, that is, personnel, for years we were able to absorb the new programs without substantial increases in personnel because I think the agency had enough personnel. We have reached a point now where we are having critical personnel problems. We are spread very thin, and we are trying to accommodate that by being very efficient. If our Agency had existed with our current mandates during the 1960's I think our budget would have increased more, and the number of personnel would have increased substantially. The 1970's have, in fact, been lean years, and I think there is a legitimate concern on the part of the President, as well as the Congress, to keep personnel ceilings low within the Government. That, unfortunately, has come along at a time when our responsibilities are increasing.

I think the new programs are very important, and I do not think that they should go by the wayside. I think a LANDSAT program, for example, is very important. Whether or not we get enough additional personnel we should have that program. We should try, to the extent we can, to release personnel through other mechanisms, such as using the university research community, through efficiencies, and the like.

Mr. AMBRO. You have to pay the research community and the universities, don't you?

Mr. FRANK. Yes, but our budget has gone up substantially. Since 1970 we have had almost a threefold increase in budget. Our problems primarily have not been in the budget area, but have been in the personnel ceiling area.

Mr. AMBRO. There is no great likelihood that those ceilings are going to be significantly changed. Who assigns priorities in NOAA to various programs for the purpose of determining relative personnel levels? How does that work?

Mr. FRANK. With some supervision by the Department of Commerce and OMB, I am responsible for that.

Mr. AMBRO. I won't pursue the degree of supervision you get from OMB and others, but I accept your answer that your budget has increased significantly over the last number of years, and that, therefore, funding levels are not a problem.

I hope that in view of the increase in services that you are required to furnish and the number of programs that have been given to you, you will be able to do all of this within the framework of these kinds of budgetary levels. No one in his right mind in this day and age in elective office in the legislative branch is going to demand that you take more money. But it seems to me that this very significant question of assigning personnel levels to agencies and departments without an indepth understanding of the augmentation of the numbers of responsibilities that you have leaves you, and therefore, our review of what you're doing, in a precarious state.

Mr. FRANK. You have pointed out a very difficult problem for us, and we will do the best we can to manage it with the personnel and the budgetary ceilings we have. To the extent we can, we will argue as hard as we can for increases.

I think what really needs to happen is recognition that NOAA is a new agency, in new fields. We're talking about, for example, fisheries

management, which is new to this country and to the world to a certain extent. We're talking about remote sensing satellites, that are new to this era. There are some agencies which have had their day, and they have done fine during their day, but their responsibilities are either less significant or can be eliminated. What I would hope is that in those situations ceiling points will be reduced so that the agencies that are growing, because of the new kinds of responsibilities they have, will have additional ceiling points.

That's of course, very hard to do, for a variety of reasons, but we will fight for increased numbers of personnel to the extent we can use them. I can assure you we will be efficient with the ones we do have.

Mr. AMBRO. On that most reassuring note, I would say for the subcommittee and all of the members who are here enthusiastically interrogating you, thank you very much, Mr. Frank, and thank you, Dr. Benton.

Mr. FRANK. Thank you, Mr. Chairman.

I might say that in a number of instances you both have delved into issues in detail. That reflects to me your deep interest in those subjects. I welcome that interest, and I welcome the opportunity to have a dialogue on those issues with you. I hope we can continue, both formally through the hearing process and informally, as you desire.

Mr. AMBRO. Thank you all very much.

Mr. FRANK. Thank you, Mr. Chairman.

[Whereupon, at 5:25 p.m., the committee adjourned.]

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APPENDIX

QUESTIONS AND ANSWERS SUBMITTED FOR THE RECORD

ISSUE: SCIENTIFIC QUALITY OF EPA RESEARCH

Question 1. What actions are being pursued or planned by EPA to enhance the scientific quality of its research? What quality control mechanism is used by EPA in its research programs? How does EPA measure the quality of its research?

Answer. As is the case with all scientific research, whether it be in the academic, private, or public sectors, the most important test of technical quality in EPA's research lies in the scientific peer review process. Over the past year, the Office of Research and Development (ORD) has taken several steps to insure that its programs are subjected to this test. First, we established a clear and strong policy calling for the publication of individual ORD studies in the open, peer-reviewed scientific literature. Next, we developed minimum requirements for periodic program reviews to the senior responsible personnel. These requirements stress soliciting advice from non-ORD scientists ongoing and planned efforts. Third, ORD established a series of program reviews at the Assistant Administrator level to address major identified programs or cross-cutting topics such as test development. An integral feature of these reviews is the participation of outside experts on the review topic. In addition, ORD has modified its grants process to significantly broaden both the solicitation of proposals and the review mechanism for those received. This mechanism includes strong extramural review and emphasis on potential scientific quality as a criteria for award.

Question 2. A visible and inexorable trend in EPA research is an increasing extramural program and decreasing EPA in-house research personnel. What impact will this trend have on EPA research and its management, quality and responsiveness? How does EPA plan to react?

Answer. Although there is a definite trend toward an increasing extramural research program, it is not yet affecting the Agency's ability to do quality research. The current extramural research program allows us to effectively manage large research programs while placing in-house expertise where it is most needed. It expands our research capabilities and provides, in addition to in-house capabilities, the necessary mix of scientific disciplines suitable for specific problems. It also gives us the fresh perspectives found in both the academic community and the private sector.

In addition, the grants program, recently initiated by the Office of Research and Development, will lessen the burden on our research staff to act as extramural project officers. Freed from routine grants administration, the research staff will be able to devote more time and effort to science and to that extramural research which needs close monitoring.

Furthermore, although extramural research is increasing, the trend is toward greater contract size and fewer contracts. In several cases, we are utilizing large directive of work contracts, which allow us to effectively perform a number of different research tasks requiring a variety of expertise. We have also established direct contacts with national laboratories, such as the Argonne and Brookhaven National Laboratories, to conduct fairly large research programs complementary to, but not duplicative of, existing agency research and of interest to our regulatory and enforcement programs.

While we find extramural research is of benefit to the Agency, we recognize that if the increasing trend in extramural research with subsequent decrease in in-house personnel goes too far, it would have a negative effect on the quality of the Agency's research and its capability to respond to regulatory and enforcement needs. We therefore intend to carefully monitor this situation and will examine other means (such as greater use of the national laboratory system for systems management contractors) to increase our leverage.

Question 3. This Committee has criticized EPA for spending relatively too much effort on identifying potential pollutants and too little on quantifying effects. (1) Isn't it easier to identify than to quantify? (2) Is this a manifestation of a weak research program? (3) Doesn't EPA need a strong and leading research effort in this area?

Answer. Part 1. Yes. Part 2. ("this" is taken to refer to the opening sentence and to the assumption that the criticism is correct.) In the health effects area we do not believe the statement to be true. While the line between identification and quantification obviously cannot be clean and unarguable the distinction is a useful one; and in our judgment the health effects program is roughly $\frac{1}{2}$ quantification and $\frac{1}{2}$ identification. To us this ratio is extremely defensible in light of (1) the function of the Office of Research and Development to anticipate problems, (2) the pollutants related to new energy developments such as synfuels, (3) the products of the synthetic chemicals industry, (4) the emerging gravity of the hazardous waste situation, and (5) the agency's responsibilities under TSCA. Part 3. ("this area" is taken to mean the quantification area.) EPA does have a strong and leading research effort in the quantification of health effect area ranging from acute clinical research on criteria air pollutants to development of short-term quantitative methods for assessing chronic health effects from environmental pollutants. We believe we are the world leaders in the quantification of environmental health effects.

Question 4. What strategy is being used to enhance the responsiveness and coordination of EPA research programs with the regulatory offices? What has been the result of this effort? Conversely, what protection is there to prevent regulatory concerns from adversely affecting scientific research?

Answer. In 1979 the Agency established a new joint research planning process to ensure that the research program responds to the regulatory needs of the Agency. Twelve research committees, oriented specifically to users of research information and thus aligned to major regulatory subject areas, were created. Recently a thirteenth committee was established to deal with Energy. These committees are co-chaired by senior managers from the Office of Research and Development and the corresponding regulatory program office. The Regions, Office of Enforcement and Office of Planning and Management also participate.

The Research Committees:

Review the upcoming year's (e.g., fiscal year 1981) research plans and formulate appropriate recommendations to improve them;

Participate in the development of budget year plans (fiscal year 1982);

Review the quality of ongoing and recently completed research (e.g., fiscal year 1980); and

Develop a multiyear research strategy.

The research strategy is the focal point of each committee's deliberations. It outlines regulatory needs, overall priorities and research responses for a three to five year period. The strategies are to be updated annually.

Recognizing the need for a forum where cross-committee and multimedia issues could be discussed and committee activities coordinated, the ORD recently established a Research Council, composed of the Assistant Administrator for Research and Development and ORD research committee chairman. The creation of this body will help to optimize the use of resources and to disseminate significant research findings to the users of research.

Although this new system has been in full operation for less than a year, significant progress in responding to regulatory needs is evident. As the strategies are developed and refined, the program will become even more focussed on EPA's research needs.

While meeting regulatory needs is of prime importance, the agency is also taking steps to ensure that the quality of scientific research is not adversely affected by this orientation toward regulatory needs. EPA has developed two major extramural programs to conduct research which supports the agency's mission but which does not respond to specific regulatory requirements. The content of these programs is derived largely from the long-term research agendas prepared by the Research Committees. The research is more forward-looking and isolated than most research conducted to meet regulatory concerns.

Exploratory research centers

In fiscal year 1979, ORD initiated an Exploratory Research Centers program which utilizes the expertise and resources of institutions and organizations, generally universities, to conduct long-term (3-5 years or longer) research. Research at these centers is directed toward anticipated future environmental problems and toward ill-defined problems requiring further exploratory effort.

Program Offices participated in establishing the direction and broad areas of research for the Centers, but projects are not tied to regulatory deadlines.

To date, three centers have been established, and five more will be initiated:

Established centers

Epidemiology (University of Pittsburgh)
Advanced Control (University of Illinois)
Groundwater (consortium of universities;
Oklahoma State, University of Oklahoma and Rice University)

To be established in fiscal years 1980 and 1981

Marine sciences
Waste elimination
Ecosystem research
Intermedia transport;
Hazardous waste

Grants program

In 1980, ORD is initiating a centralized exploratory grants program, characterized by nationwide solicitation for grant proposals and a subsequent peer review panel process. This new grants program responds to several studies and reports raising concerns about the quality of EPA's research and development activities. EPA is soliciting nationally for proposals to encourage applications from an increased number of experienced researchers, especially those who have not previously received EPA extramural research funding assistance, including handicapped, minority, and female researchers.

The solicitation procedure describes the areas of research and development for which ORD is seeking applications. The areas described were developed with participation of the Program Offices and the Research Committees to assure the relevance of the grant program to the EPA mission.

All applications are being evaluated by Peer Review panels composed primarily of non-EPA scientists acknowledged as experts in their fields. This review is intended to improve the scientific quality of the grants program. Projects selected for funding will be chosen because of a combination of scientific merit and relevance, and not be tied to specific regulatory deadlines.

Question 5. Does EPA review past research efforts to assess their quality and need for further research? Will this kind of review benefit future research planning and problem identification?

Response. The Office of Research and Development has established procedures calling for peer review of past basic research efforts to assess their quality and the need for further research.

The intramural and extramural efforts of the ORD laboratories, including basic research efforts, are reviewed by non-ORD scientists and engineers at program reviews conducted periodically for senior ORD personnel and at special program reviews conducted for the Assistant Administrators. In addition, ORD is calling for the publication of research results in peer review journals.

In the past year the ORD has developed two extramural exploratory research programs which also provide for peer review to assess scientific quality. The two programs are the Exploratory Research Centers Program and the Exploratory Grants Program. Grant recipients and Center personnel will be required to report results in peer review journals or through EPA-sponsored conferences, seminars or workshops, as appropriate. In the case of the Centers, a special provision is made at the time of the award to establish an independent peer review panel for the Center's Research. In addition, the findings from the Centers' and grantees' research activities will be presented periodically to ORD's Research Committees to determine the need for further research.

The results of these reviews and of the program reviews described above are an integral part of future research planning and problem identification.

GROUNDWATER RESEARCH

Question 6. It is difficult to develop an effective strategy for protecting groundwater without understanding it. What is the extent of EPA's knowledge of groundwater? What research needs to be done? What groundwater research is being conducted by EPA and what are its objectives?

Response. The extent of EPA's knowledge is both quantitative and qualitative. We believe this information is sufficient both for research program and overall Agency strategy design.

In more detail, EPA has (1) estimates on the numbers of potentially contaminating sources, (2) the kinds of pollutants to expect from those sources, and (3) reasonably well-documented cases of significant groundwater contamination from each of the major types of sources. EPA further knows that groundwater is a major source of drinking water, agricultural water, and industrial process water.

These data will improve as regulatory and management programs are implemented under the Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Clean Water Act, and the Toxic Substance Control Act. Further information is and has been developed by the Geological Survey, the Office of Surface Mining, and the Department of Agriculture.

Reasonable technologies are also available for controlling the pollution of groundwater from major point sources, such as surface impoundments or injection wells. We further have information on the health effects of many of the pollutants found in contaminated drinking water wells.

What EPA doesn't know quantitatively very well yet is the way organic pollutants behave in groundwater and in the unsaturated zone. Inorganics are better understood. Such information on the transport and fate of pollutants is required for (1) design criteria for control of specific sources, (2) assessment of the risk of exposure once contamination has occurred, and (3) determination of the likelihood that a pollutant will persist in the subsurface.

The main objective of the EPA groundwater research program then, is to develop information on the behavior of pollutants in the subsurface. Supportive of this objective is the development of methods to carry out studies of the subsurface and the determination of what characteristics of the subsurface affect pollutant behavior. Other important activities include information transfer, technical assistance, and development of the data for source control criteria in support of specific regulatory activities where appropriate.

The anticipatory program in groundwater is oriented toward more long-term research on (1) the movement and transformation of organic and biological contaminants in the underground environment, (2) methods for conducting groundwater investigations, and (3) the characterization of the subsurface environment.

In fiscal year 1980 a total of \$2,485,400 is being spent in groundwater research: \$1,865,400 and 16 positions in the base (Drinking Water) research program and \$620,000 and 4 positions in the anticipatory research program. In fiscal year 1981 there is a total request of \$2,520,000 for groundwater research: \$1,900,000 and 16 positions in the base and \$620,000 and 4 positions in anticipatory.

Question 7. Your fiscal year 1981 request for groundwater research is \$2.52 million, an actual decline. This seems to indicate that either you already have the knowledge needed to protect our groundwater, or you do not view groundwater quality as a significant problem, now or in the future. Which is the case? Explain.

Response. The groundwater research resources in fiscal year 1981 will be roughly the same as fiscal year 1980. This level budget reflects decisions made in the Zero-Based Budgeting process that other problems, such as small systems treatment, require significant increases in fiscal year 1981. In a time of limited research resources, where some programs require increases at the expense of other programs, a level budget does indicate the Agency believes groundwater quality is a significant problem.

In fact, the protection of groundwater will be improved significantly in the near future when regulations on Underground Injection Control (UIC) and the disposal of hazardous wastes are promulgated. Further, if the so-called "Superfund" is enacted, this will enable remedial actions at uncontrolled hazardous waste dump-sites. Finally, there is a major effort to develop an EPA groundwater strategy. This effort will address the questions of improving our data base, the adequacy of our regulatory authorities and the character of research needed for protecting groundwater, among others.

Question 8. What is the extent of our groundwater problem? What are the major contributors to groundwater pollution and where is the problem especially bad? What does EPA plan to do about this problem?

Response. The data on the extent of our groundwater problem consists of (1) estimates of the numbers of potentially polluting sources, (2) the kinds of pollutants to expect from those sources, and (3) reasonably well-documented cases of significant groundwater contamination from each of the major types of sources. However, there is a virtually complete lack of systematic data which could help to determine the magnitude of the problem. For this reason, we have not been able to derive estimates of the amount of groundwater contamination resulting from specific sources or of the amount of groundwater that is contaminated to an acceptable degree. Thus we cannot specify the major contributors to groundwater pollution or identify areas where the problem is especially bad, based on quantitative data.

These data will improve as regulatory and management programs are implemented under the Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Clean Water Act, and the Toxic Substances Control Act. Further information is and has been developed by the Geological Survey, the Office of Surface Mining, and the Department of Agriculture.

The protection of ground water will be improved significantly in the near future when regulations on Underground Injection Control (UIC) and the disposal of hazardous wastes are promulgated. Further, if the so-called "superfund" is enacted, this will enable remedial actions at uncontrolled hazardous waste dumpsites. Finally, there is a major effort to develop an EPA groundwater strategy. This effort will address the questions of improving our data base, the adequacy of our regulatory authorities and the character of research needed for protecting ground water, among others.

Question 9. Ground water experts that we have talked with say that your research on ground water is fragmented and unsystematic. They say that your research in this area doesn't appear to be integrated toward some specific objective. How do you respond to this? How are you coordinating your research on groundwater? How could this be improved? Would the consolidation of groundwater research at the Ada Lab help?

Response. The single main objective of the EPA groundwater research program is to develop information on the behavior of pollutants in the subsurface. Supportive of this objective is the development of methods to carry out studies of the subsurface and the determination of what characteristics of the subsurface affect pollutant behavior. Other important activities include information transfer, technical assistance, and development of the data for source control criteria in support of specific regulatory activities where appropriate.

The anticipatory program in groundwater is oriented toward more long-term research on (1) the movement and transformation of organic and biological contaminants in the underground environment, (2) methods for conducting groundwater investigations, (3) the characterization of the subsurface environment.

As you can see, the research objectives of both programs are similar. Both of these programs are coordinated and managed by a single laboratory, the R. S. Kerr Environmental Research Laboratory at Ada, Oklahoma.

The objectives for groundwater research in EPA have been determined by consultation with numerous groups over the past few years. The first expression of these objectives resulted from a meeting in the fall of 1976 of an advisory group representing various EPA offices, universities, the U.S.G.S., State agencies, and consultants. They have been adjusted after reviews from within the Agency, by the Science Advisory Board, the National Drinking Water Advisory Council, and the Subcommittee on the Environment and Atmosphere of the House Committee on Science and Technology. We believe this interaction and review has resulted in a cohesive program of research, information transfer, and technical assistance. However, we are continuing to stress improvements in program relevance and scientific quality through: (1) strengthened peer review; (2) Research Committees; and (3) Agency groundwater strategy development.

Question 10. If we authorized additional funding for groundwater research, how would you use it? What needs to be done, or don't you know?

Response. The objective of the EPA groundwater research program is to determine the movement and ultimate fate of pollutants in groundwater. Supporting objectives are methods development and subsurface characterization. Just as important are the information transfer and technical assistance activities. If additional funding in fiscal year 1981 were provided, we would accelerate work in methods development to provide the regulatory programs with more adequate means of detecting groundwater contamination, accelerate our development of predictive models for the transport and fate of pollutants in the subsurface, improve our ability to characterize the subsurface, and strengthen our effort (which we intend to begin in fiscal year 1981 anyway) to evaluate methods for aquifer rehabilitation. We generally know what needs to be done, but expect to continue to review and sharpen these needs through exchanges such as the current strategy development.

Question 11. Does EPA have adequate regulatory authority to protect groundwater? Since there is not comprehensive groundwater protection authority, how does EPA plan its research on groundwater?

Response. EPA has adequate regulatory authority to undertake extensive groundwater protection under the Clean Water Act, RCRA, Safe Drinking

Water Act, TSCA and FIFRA. The Agency is currently reviewing these existing authorities as a part of the development of a Groundwater Strategy, to see how they might be used to address additional groundwater problems.

Question 12. Is your research done in support of regulatory authority? Is there a comprehensive and coherent groundwater protection regulatory authority? Is this why your research is fragmented?

Response: EPA has regulatory authority to undertake extensive groundwater protection under the Clean Water Act, RCRA, Safe Drinking Water Act, TSCA and FIFRA. The Agency is currently reviewing these existing authorities as a part of the development of a Groundwater Strategy, to see how they might be used to address additional groundwater problems.

The EPA groundwater research program is planned to provide the scientific data for protecting groundwater from contamination, regardless of the available regulatory authority. Although the Federal regulatory authority is not comprehensive, State and local water resource managers can have a great influence on activities that could potentially pollute groundwater. A considerable portion of the groundwater research program resources are devoted to information transfer activities to educate these managers in groundwater protection. While we believe that much can and should be done to strengthen our groundwater research for the future, we do not believe our current program is fragmented.

GREAT LAKES RESEARCH

All of the first four questions are closely related.

Question 13. Why is \$500,000 being cut from Grosse Ile after the \$2 million was specifically added by the Subcommittee to pursue toxics research?

Response. The question assumes that \$500,000 were cut from the Grosse Ile laboratory budget. That is not an accurate description of what is occurring. For a number of reasons, EPA has centralized its program of review and award of research grants. By doing this, the Agency will achieve a consolidated peer review system which will establish the scientific merit associated with each proposal submitted by researchers. This process stimulates competition among the Nation's scientists, permits the Agency to select only the best quality proposals and helps us reach the goal of allocating 15 percent of our research resources to long-range studies. This goal is expressed in PL 95-155: The Environmental Research and Development Act of 1978. By consolidating grant resources and authority, we have been able to publish nationwide solicitation requests for grant proposals. On February 7, 1980, some 8,000 pamphlets were distributed among potentially interested researchers in which our Great Lakes Research program is included on pages 7 and 8:

Great Lakes Studies: Studies conducted in the Great Lakes and smaller lakes have documented phosphorous levels and levels of other organic and inorganic compounds. The data has been used to develop models describing the relationship between phosphorous levels and the trophic state of the Great Lakes. Additional data which:

- (a) Describes phosphorous-plankton relationships;
- (b) Relates phosphorous input to available phosphorous and to observed levels;
- (c) Relates phosphorous levels to trophic state;
- (d) Extends the data base to include other significant organic and inorganic pollutants.

is required to validate the models.

In addition, the contribution of airborne pollution to pollutant levels in the lakes must be better understood since this may be a major source of pollution affecting the food chain. Some available evidence indicates that this may be a significant source of PCB input to Lake Superior. Additional studies to aid in understanding the importance of this pathway for other organic and inorganic pollutants as well as PCB are needed.

This solicitation will provide a larger number of higher quality proposals than would be possible under previously-existing conditions.

Question 14. What ongoing programs at Grosse Ile would be affected? Are all EPA labs being asked for a 14 percent contribution?

Response. The research grants which Grosse Ile would have awarded on its own are now consolidated with other such funds and will be made competitive and subjected to review by panels of peer scientists. Grants which are specifically related to the functions of the Grosse Ile laboratory will be funded to the extent of about \$500,000 if there are meritorious proposals among the competing ones.

High quality grants which provide basic knowledge leading to the control of toxic substances in lakes and rivers will be supported, because we are soliciting for such applications, and are receiving proposed project descriptions now.

The resources available for research grants in EPA amount to about 14 percent of the extramural resources from all research programs.

Question 15. What assurance is there that the research outcomes resulting from the reprogramming will be better than those from previously approved, ongoing programs that will have to be cut?

Response. By consolidating some of the research grant resources for Great Lakes Research with other, related resources for grant-supported research, we have a sufficient sum to establish a competitive peer-reviewed set of proposed projects from which we will select those with the highest scientific merit and greatest relevance to the research goals of the Great Lakes Program. Only by consolidating Agency resources can the peer-review panels provide such beneficial competition. Institutions which have previously been engaged in the Great Lakes Research Program will, of course, be welcomed as competitive applicants for grants.

Question 16. What specific regulatory decisions will be impacted by the projects supported by the reprogrammed funds?

Response. The entire Great Lakes Research Program will receive substantial benefit from its participation in the consolidated competitive grants program. The results of this research will impact Agency regulations for both organic and inorganic pollutants and their impacts on the lakes' environment and human health. The contributions of air pollution to PCB levels will also be studied with a view to identifying potential controls.

These longer-range studies will emphasize the impacts of more complex relationships among pollutants/environment humans than can short-term studies, and will produce this information over several years which can help establish better control practices.

Question 17. Will the fiscal year 81 request of \$1.6 million for Grosse Ile allow presently ongoing toxics research programs to be completed? If this figure will necessitate cutbacks, what will be cut back?

Answer. Expenditure of the \$1.6 million will allow ongoing toxics research to continue and to focus on achieving important near-term goals. Studies which are central to the program's mission, i.e., data acquisition required to continue modeling efforts, are preserved. We do not expect to complete all this work in fiscal year 81, and would expect it to continue beyond that date. At this level of funding, we do not plan to undertake new initiatives, such as studies of a more experimental or basic nature.

Question 18. What action has EPA taken to enhance its socio-economic research program? In what areas is this research focused?

Answer. EPA has taken a number of actions since 1976 with regard to its socio-economic research program. The first of these, starting in fiscal year 76, was to reorient its Headquarters economic benefits research program to focus on a few areas of environmental economics.

Because of the technical difficulty of pollution control benefits research, EPA concluded that only the best available expertise could hope to make much progress with it. The Agency therefore tried to develop focal points of expertise through longer term commitments.

The first major results of this approach were published in 1979 with the issuance of a five volume report on the economic benefits of air pollution control prepared by faculty members from the University of Wyoming and two other Western universities. This report reaches markedly different conclusions than earlier studies, suggesting that morbidity and aesthetic benefits may be much larger than the mortality benefits emphasized in most previous studies.

In fiscal year 80 a somewhat similar effort was initiated with Resources for the Future to take new approaches towards determining the benefits of water pollution control. Together with the continuing University of Wyoming effort and other smaller efforts managed at both Headquarters and in our field laboratories, EPA believes that it now has a benefits research effort that has and will make progress towards understanding this difficult area.

More recently, ORD has proposed a new Office of Strategic Analysis and Special Studies to couple economic benefits research with other economic research tools used by Strategic Analysis Group. These tools include input-output-type models applied to gain a better understanding of the implications of alternative pollution

control scenarios. The new Office, which also has the responsibility for preparing the Office of Research and Development's *Research Outlook*, will make it possible to better coordinate and integrate most of the socioeconomic research managed at Headquarters, as well as giving it more visibility and senior management attention.

Question 19. When EPA makes a regulatory decision, are their economic impacts considered during the decision process? If so, is this done for all regulatory decisions? What statutes mandate EPA to perform economic research, that is, cost-benefit analysis?

Answer. EPA carefully considers the economic impact of its regulations. To do so, we conduct economic analyses of our regulations before they are proposed, and we encourage public comment on the adequacy of our analyses.

EPA has a formal system for conducting economic analyses which is described in "Improving Environmental Regulations; Final Report Implementing Executive Order 12044." The type of analysis we carry out depends on the significance of the regulation. For regulations whose additional annual costs exceed \$100 million or additional costs of production exceed 5% of the selling price of a product, EPA conducts a Regulatory Analysis which meets the requirements of Executive Order 12044. This Regulatory Analysis includes an assessment of the economic impact of the proposed regulations in terms of price effects, production effects, industry growth, profitability, capital availability, employment effects, community effects, balance of payments effects, and energy effects.

For those regulations that do not require a formal Regulatory Analysis, EPA still conducts an economic analysis. Depending on the type of regulation, the analysis may be similar to the one conducted as part of a Regulatory Analysis except the level of detail may be less. The guiding principle is to conduct an economic analysis that will give EPA an understanding of the economic impact of the proposed regulation. The type of analysis and level of detail are adjusted to the specific regulation EPA is developing.

In addition, EPA has embarked on an experimental program to measure the costs and benefits of new regulations. During the next two years EPA will conduct as many as ten of these studies, drawn from all areas of EPA regulatory activity, in an attempt to assess the feasibility of conducting routine cost-benefit assessment for new regulations. Of course, EPA is already mandated to consider and does calculate economic costs and environmental and health impacts for certain regulations promulgated under various statutes.

For instance, the Safe Drinking Water Act requires EPA to establish national drinking water standards which "... shall protect health to the extent feasible ... (taking cost into consideration). ..." The Toxic Substances Control Act states that EPA "... shall consider the environmental, economic, and social impacts of any action the Administrator takes or proposes to take. ..." And finally, both the Clean Water Act and the Clean Air Act require consideration of cost—in the Water Act in our effluent guidelines regulations, and in the Air Act for New Source Performance Standards for stationary sources.

Question 20. What research is EPA doing on aquatic weeds in FY-80?

Answer. Thus far in fiscal year 1980 the only research which is being supported on aquatic weeds is through a grant to the University of Florida. This effort is to determine the impact of integrated chemical/biological weed control on the fishery environment and water quality in a Florida lake. A workshop on aquatic weeds will be held in late February to aid EPA in the finalization of an aquatic weed research plan for fiscal year 1980. Following the finalization to have high priority will be supported. Individual projects will be designed to produce user-oriented results at the completion of each project.

Question 21. Why is EPA terminating the aquatic weed research program in FY 81? Will all the problems have been solved?

Answer. Although not all the aquatic weed problems will be solved, EPA is not planning to support aquatic weed research program in fiscal year 1981. Aquatic weed research has a relatively low priority within the Agency when compared to other problem areas which must be addressed, such as the problems associated with hazardous waste disposal sites and control of toxic substances. The Agency's zero base budgeting (ZBB) process did not support research in this area for fiscal year 1981.

Question 22. What will EPA do if a program is again mandated?

Answer. If the Agency is again mandated to support an aquatic weed research program, additional user-oriented projects will be developed. The character of these projects will depend both on the conclusions reached at the February workshop and the initial results of the projects supported in fiscal year 1980.

Question 23. "EPA has no research program in the area of ionizing radiation. Who performed the studies on the health effects of radioactive material that EPA used in its decision? Why does EPA feel these results are "sufficiently accurate" to warrant regulation of radionuclides?"

Response. The biological effects of radiation exposure caused by radioactive materials have been extensively studied by many investigators over an extended period of time. This information has been summarized in the National Academy of Sciences,¹ the United Nations Scientific Committee on the Effects of Atomic Radiation,² and the International Commission on Radiological Protection.³

It is EPA's judgment, after review of this vast body of data in detail, that the risk of many different kinds of cancers is increased when human populations are exposed to increased levels of radiation. We believe our data base is sufficient to allow us to make estimates of health risk and that these estimates are accurate enough to warrant the listing of radionuclides as a hazardous air pollutant. We do not believe further research is likely to change this conclusion. The exact relationship between the levels of radiation exposure and the risks of cancer is under continuing study and only small modifications in current assumptions are to be expected as a result.

Question 24. "How will the agency devise the data and analysis necessary to determine control options? Does EPA intend to establish a research capability in its Office of Research and Development?"

Response. Information on control options to be used in developing radionuclide emission standards will be obtained through contractors with engineering expertise in control technology. These contracts may involve in-plant studies of existing control systems. In evaluating radionuclide control options for the nuclear industry, EPA and its contractors are dependent to a great extent on information developed by DOE and NRC research programs. In addition, information from EPA research programs for nonradioactive pollutants is applicable in many cases to radionuclide emissions.

EPA does not intend to establish a research capability for the control of radionuclide air emissions in its Office of Research and Development.

Question 25. "Radionuclides are used and produced in thousands of locations. What are the regulatory implications? Where are the risks greatest? What are EPA's regulatory priorities? What action is planned?"

Response. While radionuclides are used in many locations, most of the facilities emit small amounts of radionuclides and are not serious threats to health. For those source categories posing significant risks, EPA will establish priority status for further regulatory action based on the following criteria: (1) the total population risk of excess cancer incidence associated with current and future source emissions, (2) cancer risk for the most exposed individual, (3) ease of standards development and implementation, and (4) feasibility of improving emission controls.⁴ In addition, EPA considers the relationship of the standards development program to other Federal regulations and to National energy policies.

Once EPA has established priorities, they will be published as an Advance Notice of Proposed Rulemaking. High priority standards development programs will begin at once so that regulations can be proposed and promulgated in a timely fashion. Currently the levels of effort are approximately 30 professional positions supported by about 2.5 million dollars per year of outside the Agency contacts.

Based on our initial review,⁵ the estimates of health risks are greatest for those unregulated source categories emitting naturally-occurring radionuclides. Accordingly, our preliminary priorities for standards development programs include coal-fired steam electric generator stations and industrial boilers, phosphate industry facilities, and uranium mines. Each of these sources will be examined in greater depth prior to any proposal of standards. Some of these may not require any additional standards to protect against the effects of radionuclides, for others, radionuclide standards would be incorporated as part of emission standards for nonradioactive air pollutants.

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ISSUE: REGULATION OF RADIONUCLIDES

Question 26. If EPA can regulate in this area with no in-house research capability, does it need research in other areas (i.e., air, water . . . etc.)?

Answer: In the United States, there are a number of very qualified non-EPA research institutions working on radiation health effects. Since 1976, we have relied heavily on their radionuclides work and focussed our in-house program on the effects of non-ionizing radiation (NIR), an emerging problem of concern.

However, EPA personnel working in the NIR program also have expertise in the field of ionizing radiation health effects. They provide this expertise when necessary to support regulatory decisions. In addition, EPA maintains a capability for measuring radionuclides (e.g., in water) and determining biological effects. Using such capability, we carry out a reimbursable measurement and bioeffects program with the Department of Energy.

In contrast to the small radiation program, and in concert with legislative mandates, EPA maintains several unique in-place research capabilities and expertise in the large air and water pollution areas. We are continuing to develop and refine research capabilities for toxics, hazardous wastes and other areas. The information generated by this research supports our regulatory and enforcement programs. Given our environmental research capabilities, other agencies look to us, as the principal environment agency, to provide research information in these areas.

Question 27. What particular form of ZBB is used to develop EPA's priorities? Could you be specific in your explanation?

Answer. In EPA's fiscal year 1981 ZBB process, each program (e.g. emission standards and technology assessment) is developed at four different levels (decision unit levels) of activity, defined as 75 percent, 90 percent, 100 percent and 110 percent of the prior year resources. Decision unit levels from different programs are then ranked against each other in three separate ranking sessions.

Initially, each Assistant Administrator prioritizes the decision unit levels within his/her office. Thus, the Assistant Administrator for Air, Noise and Radiation ranks those Air, Noise, and Radiation programs under his/her control.

In the second ranking session, all programs in a major program area or media (Air Quality, Water Quality, etc.) are ranked against each other by members of Media Task Groups. For example, in the Air Quality Media Ranking, research and development decision unit levels are ranked against enforcement and abatement and control levels. (All Meeting Task Group members have direct involvement in the programs in a given media.)

Finally, the Agency Ranking Committee, which consists of EPA's six Assistant Administrators and three of the ten Regional Administrators ranks decision unit levels from all programs against each other to produce an inter program or inter-media ranking.

The Agency Ranking Committee is then reviewed by the EPA Administrator who resolves any issues and who may make changes to reflect his/her priorities.

EPA PLANNING AND MANAGEMENT

Question 28. In your testimony to our committee you referred to "centers of excellence," i.e. primarily universities performing Research and Development for the EPA. To what extent is the EPA coordinating these efforts with work and solicitation of guidance, advice, etc., from the private sector?

Response. Guidance and advice from the private sector regarding the thrust and direction of Center activities was deliberately built into the program. Thus, in the initial planning stages, the list of areas of national needs, which form the basis of Center research themes, was developed by soliciting inputs from both the public and private scientific sectors of the country. Additionally, each Center has a National Advisory Board, which is representative of the national perception of research needs and whose members are external to EPA and the Center institutions.

Question 28, part 2. What responsibilities should the private sector have in contributing to the Research and Development efforts of EPA (according to EPA policy)?

Response. Contributions from and acceptance by the private sector are key to EPA's effectively performing its mission. Consequently, the Agency actively solicits private sector assistance and places a high priority on communicating effectively with a wide range of private individuals, organizations and institutions.

These efforts include using both formal and informal mechanisms for obtaining information, advice and quality research products. As you know, the Science Advisory Board, whose members are drawn from the nation's top scientists, is one mechanism we use extensively, and on a continuing basis. We also frequently request the assistance of the National Academy of Sciences-National Research Council-National Academy of Engineering-Institute of Medicine which also gives us access to the nation's top scientists and engineers. Periodically, we enter into cooperative agreements or contracts with an organization to convene workshops and conduct symposiums. Recent examples include a National Academy of Sciences workshop to help us identify future environmental problems and advise us on longer-term research needs and two Public Health Initiative planning projects organized for us by Pennsylvania State University. Less structured, but equally important, interactions with the private sector include review of major reports, such as our *Environmental Outlook* report, by a large number of private sector individuals and organizations.

Numerous other examples could be cited. However, what they illustrate is the recognition that the Agency cannot effectively achieve its assigned mission if we do not have the assistance, understanding and support of a broader scientific-technology community.

Question 29. You also mentioned how EPA has been developing a "closely interrelated set of reforms that will allow us to get "more for less". Do you mean more cost-effective here? Could you specify re: "more for less"?

Answer. Our reforms will allow us to obtain cost-effective environmental controls. The specific reforms EPA has developed come under the general category of "controlled trading." This includes the bubble policy, offset trades, banking of emission reductions for future use or sale, and consideration of marketable permit approaches to regulating nonaerosol chlorofluorocarbon uses if that should prove feasible. These reforms allow industry flexibility in determining how they meet pollution control requirements. This often gives firms the opportunity to reduce costs of control thus saving money for industry and the consumer.

Question 30. Regarding "Safety", how often are we (EPA) calculating for the "worst possible case", to the point where cost-effectiveness is ignored? Exactly how are uncertainty factors calculated, that is, the "worst case", average probability, etc.?

Answer. In conducting a health risk assessment, we first determine the effects of the pollutant on various populations. We then generally select the most sensitive population and develop ambient standards or emission/effluent limits to protect that sensitive population. An example is the National Ambient Air Quality Standard for lead. In this case, the most sensitive population is children. Uncertainty is accommodated by assuming standard statistical distributions. Once we establish the mean level where the effect occurs in the sensitive population, we generally set the numeric standard at a lower level to protect the more sensitive individuals within the sensitive population. Statistically, this increased level of protection is typically the 95% level. The approach is a "worst case" approach in that it establishes protection for both the sensitive population and most if not all more sensitive individuals within that population. If the health-effect of concern does not have a demonstrated no-effect level—i.e. cancer, we seek to establish reasonable levels of risk by using models to extrapolate the data from animal studies. In this case, the uncertainties are usually rather large but are accommodated by the use of conservative models.

Cost-effectiveness in the sense of dollars per pound of pollutant removed is not typically applied in these risk assessments. In those cases where our statutory authority demands or permits consideration of costs, we will estimate the costs associated with the control technologies required to meet the standard or emission/effluent limit. If those costs appear unreasonably high, we typically cost-out alternative less restrictive control technologies and compute risks associated with these alternative levels of control. The incremental costs and risks of the alternatives are then compared. If we find that substantial costs are required to achieve only marginal or insignificant reductions in risk, we may elect the more cost-effective alternative. We ignore such cost-effectiveness considerations when the alternatives result in significant increases in risk levels.

AGRICULTURE RELATED RESEARCH

Question 31. Do you feel that there has been enough research work completed to provide the correlation between control measures (BMPs) and improvement of water quality within a stream or lake receiving runoff from agricultural lands?

Answer. No, I do not. We have made some progress in developing mathematical models for correlating certain Best Management Practices with resulting water quality and schemes for selecting available BMPs for use in specific situations. However, more work needs to be done to verify these models under actual field regions for a wide range of agricultural and climate conditions. We are hopeful that the Department of Agriculture will pick up some of these activities under its Rural Clean Water Program, and will be conducting discussions with them concerning this.

Question 32. Do you have research results that indicate any change or potential change in the quantity and/or quality of groundwater in the area where BMPs are recommended? My logic tells me that when runoff waters are slowed or retained on the land, there is more time for the water to enter the soil and move downward taking the mobile pollutants to the ground water—is this not correct?

Response. Implementation of changes in agricultural practices may indeed cause a new set of environmental problems. Just as changing from conventional plowing to minimum tillage to minimize erosion problems results in increased application of chemical herbicides and the potential of higher concentrations in runoff, so changing from straight-row planting to contouring or terracing will reduce runoff and increase infiltration and the potential movement of some soluble nutrients and pesticides down through the soil. We have recognized that these trade-offs exist and have sought to develop schemes for selecting practices that would not replace one set of problems with another. BMP implementation in irrigated agriculture has produced positive, dramatic changes in both ground and surface water quality. Studies in nonirrigated agriculture have not progressed sufficiently to be able to obtain similar information.

Question 33. If we don't know the relationships between the BMPs and the resulting change in surface water quality and their effect on groundwater, I think that these questions need to be addressed before you (EPA with 208 and USDA with RCWP) ask the American farmer to put up at least one-half of the funds to implement BMPs for improvement in water quality when their effectiveness is unknown, and in fact, could be harmful to groundwater. This year alone, \$50 million in federal funds must be matched by the farmers, and this is a significant amount of money for those farmers involved, if we don't know the results or the effectiveness of the practice. With these facts in mind, what will be the level of effort by EPA to find these answers during fiscal year 1981? I assume you are reversing the downward funding trend of the past few years in your renewable resources category.

Answer. Unfortunately, we are sharply curtailing our efforts in this area, in response to a determination that this area will be principally the responsibility of the Department of Agriculture, and as previously indicated, we will be working to encourage their efforts.

For fiscal year 1981, we are requesting funding limited to \$300,000 and 10 positions. These resources will be utilized to oversee the completion of ongoing studies and to continue to provide technical assistance to EPA program and regional offices and to those state and local agencies with agriculturally related water pollution problems. The staff will also be involved in developing manuals, bringing together the results obtained over the past years into logical, cohesive presentations of how-to-do-it information.

Question 34. How do you plan to get the work done and who has the legislative mandate to do the work?

Answer. Because our fiscal year 1981 resources will be adequate for supporting only a limited staff, no extramural projects will be conducted. Work on BMP development historically has been a USDA activity while the correlation of these practices with water quality has largely been the role of EPA. Many such studies have combined the mutual interests of both agencies in jointly funded research projects. We are exploring with USDA their potential assumption of additional responsibility for BMP/water quality studies.

Question 35. What does ORD's fiscal year 1981 budget contain—in dollars and personnel slots—for the Renewable Resources program at the Ada and Athens Laboratories?

Response. The total fiscal year 1981 budget for Renewable Resources contains \$300,000 and 10 positions. Allocation of these resources among headquarters and the Ada and Athens Laboratories has not yet been made.

Question 36. Will EPA have scientifically sound information to establish appropriate environmental guidelines for synfuels processes? How will this judgment be made?

Answer. NSPS which are existant or in preparation will cover most anticipated air emission sources in shale oil and coal gasification processes. However, EPA will have only limited information on which to base environmental guidance in the 1980-81 time period. Competing shale oil and coal liquefaction processes are only in the pilot stage and the magnitude and species of air emissions cannot be predicted accurately. For criteria pollutants it should be possible within the time frame of the pollution control guidance documents (PDGD) to predict the effectiveness of control devices and emission levels from control devices. However, these values probably will not be based on tests at real synfuel plants. What may be difficult will be: (1) to assay the health risk of organic pollutants, radionuclides, and trace metals emitted, and (2) to assess fugitive emissions and means of capturing them.

Question 37. Now will EPA coordinate its energy research with other agencies involved in synfuels technology development?

Answer. It is important that EPA maintain close coordination with the Department of Energy and other agencies involved in developing or environmentally assessing synfuel technologies. Toward this end, the EPA has worked closely with DOE and HEW to establish a joint program to identify and review the adequacy of current research programs relating to environmental impacts of synthetic fuel and other advanced energy technologies. This effort has been performed through the auspices of the Federal Interagency Committee on the Health and Environmental Effects of Energy Technologies. A draft report has been prepared which is currently being reviewed which identifies research needs.

EPA is also intensifying its coordination activities with DOE in the area of control technology performances and costs. Through both staff contacts and high level communication, the Agency is attempting to develop a coordinated program with DOE that will allow us to generate acceptable data bases for the Pollution Control Technology Guidance Documents and ultimately control technology based emission/effluent standards. One mechanism which is being considered is a joint planning arrangement whereby EPA and DOE would meet periodically to jointly plan a research program in this area.

Question 38. What strategy will EPA follow to ensure that emission control technology that complies with EPA standards is developed along with the production technology and subsequently, is incorporated into synfuels processes?

Answer. The EPA air strategy will rely on NSPS and PSD buttressed by NESHAP where appropriate. Some aspects of coal liquefaction and gasification and shale oil processes are already covered by NSPS or will be in the near future. While these standards specifically limit criteria pollutants, the resultant control equipment will also collect many potentially hazardous materials. Almost all plants will be new and therefore subject to NSPS.

PSD regulations should prevent large synfuel plants from locating in Class I areas and should limit the concentration of plants in a given area.

NESHAP needs cannot be assessed with present information. The most suspect hazardous pollutants are polycyclic aromatic hydrocarbons which will be impacted by the risk decision on POM scheduled for mid-1980. If POM is listed as a hazardous pollutant under Section 112 of the Clean Air Act, synfuel plants could be subject to NESHAP or NSPS depending on the risk potential.

Question 39. What criteria must information satisfy before EPA will make a regulatory decision on diesel emissions? Does EPA have this type of information on diesel emissions?

Answer. The HC, CO, and NOx emissions from light duty Diesels are currently regulated based on the criteria set forth in the Clean Air Act. EPA plans to issue final rulemaking on the Light-Duty Diesel total particulate standard shortly based on criteria presented in Section 202 of the Clean Air Act. EPA is still in the process of obtaining information on the potential carcinogenicity of Diesel emissions. This information of the various bioassay tests, skin painting, intratracheal instillation, and whole animal inhalation tests. The criteria used to determine if regulatory action is necessary to protect the public health will be based on unreasonable risk (i.e. does the Diesel create an unreasonable cancer risk?). One component of information which will impact this decision will be a carcinogen risk assessment projecting the number of excess cancer deaths possible with increased use of Diesels.

Question 40. Will EPA have enough scientifically sound information to equitably regulate diesel emissions by 1981?

Answer. EPA plans to have an extensive data base on health effects of Diesel emissions in 1981 for use in determining what regulatory steps, if any, are needed

to protect the public health. However, some of the skin painting, intratracheal instillation, and possible other projects will continue beyond 1981.

Question 41. Other air pollution problems, such as photochemical oxidants, have been persistent. Does EPA foresee a similar tenacity with diesel emissions? Is it wise to terminate most of this research in 1981?

Answer. Photochemical oxidant would be a problem with both the Diesel and gasoline engine. This problem is being addressed by the motor vehicle standards for HC and NOx. Some of the other potential non-cancer problems with the Diesel would be related to the particulate mass emissions which are being addressed by the Light Duty Diesel particulate standards. Also, both smoke and odor are regarded as potential problems but from a welfare rather than health viewpoint.

At this time, EPA does not have evidence of any other potential noncancer problems with the Diesel. Thus, the EPA research is concentrating on the Diesel cancer area. EPA is presently reviewing the on-going Diesel cancer research that should be continued in fiscal year 1981 so that the more promising projects can be pursued.

Question 42. What will happen if DOE comes in with conflicting results on diesel emissions after EPA is out of the game?

Answer. EPA-ORD has spent about \$17,000,000 in its Diesel health programs in fiscal year 1978, 1979, and 1980. Although the Diesel health research programs EPA will have in fiscal year 1981 and beyond are not finalized, some programs will definitely continue. It should be mentioned that selected Diesel health research work would be terminated at EPA only in the sense that a particular study was completed and either provided the needed information or additional work in that specific area seemed unnecessary.

EPA does plan to follow the DOE studies. It does appear likely that DOE's work will complement our results. If DOE's results do conflict, any necessary research and/or analysis to resolve the differences could be performed without major difficulty.



